



Draft Environmental Impact Statement  
for a

Proposed Recreation  
Area Management Plan  
and Amendment  
to the California Desert  
Conservation Area Plan:  
Imperial Sand Dunes  
Recreation Area



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**United States Department of  
the Interior**  
**BUREAU OF LAND MANAGEMENT**  
El Centro Field Office  
1661 South 4<sup>th</sup> Street  
El Centro, California 92243



March 28, 2002

Dear Reader:

Enclosed for your review is the *Draft Environmental Impact Statement (Draft EIS) for a Proposed Recreation Area Management Plan and Amendment to the California Desert Conservation Area Plan: Imperial Sand Dunes Recreation Area*. The Bureau of Land Management (BLM), the federal lead agency, has prepared the Draft EIS in accordance with the National Environmental Policy Act (NEPA).

This Draft EIS is a comprehensive environmental analysis of alternatives (including the No Action Alternative) for the revision and updating of the *Recreation Area Management Plan and Environmental Assessment for the Imperial Sand Dunes* (BLM, 1987). A revised Recreation Area Management Plan (RAMP) would provide direction and guidance on the management of land use and resources of the Imperial Sand Dunes Recreation Area (ISDRA) that would be consistent with current public needs and resources status. Implementing a revised RAMP would also constitute an amendment to the California Desert Conservation Area (CDCA) Plan in accordance with BLM planning regulations (43 CFR 1610.3-2).

The purpose of revising the 1987 *Recreation Area Management Plan* is to develop a comprehensive and detailed management plan consistent with conditions and guiding statutes as they exist at the ISDRA in the early 21st century. A revised RAMP would be designed to provide a variety of sustainable off-highway vehicle (OHV) and other recreational activities, and to maintain or improve the conditions of the special-status species and other unique natural and cultural resources, while creating an environment to promote the health and safety of visitors, employees, and nearby residents.

The public's involvement in the development of Draft EIS has been instrumental, and continued public participation is considered key to the success of the ISDRA management program. A 90-day public comment period has been established for the Draft EIS. It begins March 29, 2002, and ends June 28, 2002. Comments concerning this Draft EIS are welcome and will be considered in the preparation of the Final EIS. Please mail comments to the letterhead address above with attention to Jim Komatinsky.

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March 28, 2002

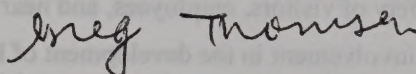
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Six public meetings will be held to obtain additional public input on the Draft EIS. All the meetings will occur from 7 PM to 10 PM. The dates and locations of these meetings are as follows:

April 9, 2002	El Centro, CA	City Council Chambers 1275 Main Street El Centro, CA
April 11, 2002	Long Beach, CA	The Grand 4101 East Willow Street Long Beach, CA 90815
April 15, 2002	Phoenix, AZ	Phoenix College 1202 West Thomas Road Phoenix, AZ
April 18, 2002	Brawley, CA	Brawley City Council 225 A Street Brawley, CA 92227
April 23, 2002	Yuma, AZ	Yuma Civic and Convention Center 1440 West Desert Hills Drive Yuma, AZ
April 25, 2002	San Diego, CA	Marriott Mission Valley 8757 Rio San Diego Drive San Diego, CA 92108

The dates, times, and locations of these meetings will also be announced in the *Federal Register* and published in local newspapers in the near future.

Sincerely,



Greg Thomsen

Field Manager, El Centro

Enclosure

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# ABSTRACT

This Draft Environmental Impact Statement (DEIS) for the proposed Recreation Area Management Plan and Amendment to the California Desert Area Plan: Imperial Sand Dune Recreation Area (project). The project is a proposal by the U.S. Bureau of Land Management (BLM) to revise and update the *Recreation Area Management Plan and Environmental Assessment for the Imperial Sand Dunes*. The Imperial Sand Dunes Recreation Area (ISDRA) is located in Imperial County, in southeastern California, approximately 25 miles west of the Colorado River and immediately north of the border between the United States and Mexico.

The project would provide direction and guidance on the management of land use and resources of the ISDRA that would be consistent with current public needs and resources status. The project includes the designation of management areas, assignment of Recreation Opportunity Spectrum (ROS) classifications to those management areas, enhancement of efforts to encourage a safe and enjoyable recreational experience for the user, and emphasis on public education about OHV use in the context of the recreational, cultural, and biological resources of the area. Where facilities are planned, and where law enforcement is planned to be increased, these actions are proposed to enhance public safety in the context of an enjoyable recreational experience.

Implementing a revised RAMP would constitute an amendment to the California Desert Conservation Area (CDCA) Plan, in accordance with BLM planning regulations (43 CFR 1610.3-2). The BLM is the lead agency for this DEIS, and maintains primary responsibility for compliance with National Environmental Policy Act (NEPA) for actions on federal lands it manages. In addition, the BLM is responsible for consulting with the United States Fish and Wildlife Service (USFWS) to ensure that the project complies with the Endangered Species Act (ESA). The USFWS is a cooperating agency under NEPA.

The project incorporates measures to reduce the level and significance of impacts to the human environment. With the application of mitigation measures, the project would not result in significant adverse effects.

Project alternatives that are analyzed in this DEIS include:

- Alternative 1: No Action Alternative
- Alternative 2: Recreation and Resource Protection Alternative
- Alternative 3: Natural and Cultural Resource Alternative
- Alternative 4: Motorized Recreation Opportunities Alternative



**Federal, State,  
and Local  
Agency  
Authorizing  
Actions  
Required for  
Project  
Implementation**

- Issuance of the Record of Decision (ROD) to allow the BLM to move forward in amending the CDCA Plan with an updated RAMP. The amendment of the CDCA Plan would then allow for implementation of the management actions described in the RAMP.
- Biological Opinion from the U.S. Fish and Wildlife Service as a result of formal consultation with the BLM in conformance with Section 7 of the federal Endangered Species Act.



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# EXECUTIVE SUMMARY

## ES-1 INTRODUCTION

The Bureau of Land Management (BLM) has prepared this Draft Environmental Impact Statement (DEIS) to analyze the potential environmental impacts resulting from the revision and updating of the 1987 *Recreation Area Management Plan and Environmental Assessment for the Imperial Sand Dunes*. A revised recreation area management plan (RAMP) would provide direction and guidance on the management of land use and resources of the Imperial Sand Dunes Recreation Area (ISDRA) that would be consistent with current public needs and resources status. Implementing a revised RAMP would also constitute an amendment to the California Desert Conservation Area (CDCA) Plan, in accordance with BLM planning regulations (43 CFR 1610.3-2).

This DEIS is prepared in accordance with National Environmental Policy Act (NEPA) of 1969, as amended, the President's Council on Environmental Quality (CEQ) Guidelines for the implementation of NEPA, and the BLM NEPA Handbook (H-1790-1). The BLM is the lead agency for this DEIS, and maintains primary responsibility for compliance with NEPA for actions on federal lands it manages. In addition, the BLM is responsible for consulting with the United States Fish and Wildlife Service (USFWS) to ensure that the Preferred Alternative complies with the Endangered Species Act (ESA). The USFWS is a cooperating agency under NEPA. Pursuant to NEPA, the environmental consequences of the project alternatives are analyzed in this DEIS.

This Executive Summary includes the following sections:

- ES-2 Background
- ES-3 Purpose and Need
- ES-4 Plan Area
- ES-5 Public Scoping Issues
- ES-6 Project Alternatives
- ES-7 Preferred Alternative
- ES-8 Summary of Impacts

## ES-2 BACKGROUND

The ISDRA, which comprises the largest mass of sand dunes in California, is located in Imperial County. The ISDRA is recognized as a world-class off-highway vehicle (OHV) recreation area to the Southern California region and vicinity because of the outstanding opportunities it presents for OHV



recreational activities. In addition, the ISDRA provides unique habitat for several endemic and sensitive plant, insect, and animal species.

The BLM is required to manage recreational use such that the conditions of special-status species, and other unique natural and cultural resources, are maintained or improved. The type and level of OHV use, in particular, must also be carefully managed to create an environment that promotes the health and safety of visitors, employees, and nearby residents.

Continued population growth in Southern California and the expanding popularity of OHV recreation have resulted in a steady increase in demand for outdoor recreation at the ISDRA. Proportionate to the increase in visitation is the increase in frequency of trespass in the North Algodones Dunes Wilderness and on private lands, which has resulted in conflicts among OHV enthusiasts, landowners, and concerned members of the public. Growing attendance also underlies, in part, the increased incidence of law enforcement violations.

### ES-3 PURPOSE AND NEED

The purpose of revising the 1987 RAMP is to develop a comprehensive and detailed management plan consistent with conditions and guiding statutes as they exist at the ISDRA in the early 21st Century. A revised RAMP would provide a variety of sustainable OHV and other recreational activities, and maintain or improve the conditions of special-status species and other unique natural and cultural resources, while creating an environment to promote the health and safety of visitors, employees, and nearby residents.

The need to revise the 1987 RAMP is based on changes that have occurred since 1987, such as special-status species designations and increased the demand for outdoor recreation, that have implications for and indicate the need to revise management approaches at the ISDRA. In addition, since the RAMP was written in 1987, several of the projects identified in that plan have been implemented. Of the projects that were not implemented, some are no longer feasible. Therefore, it is critical for the BLM to revisit some of the past decisions and determine whether or not new courses should be charted.

### ES-4 PLAN AREA

The Plan Area encompasses the ISDRA and a buffer management area. It comprises approximately 227,000 acres of land in California, covering an area more than 40 miles long and averaging 5 miles in width. Of this total acreage, approximately 208,000 acres are managed by BLM; 16,000 acres are privately owned; 1,700 acres are owned by the United States military; and 900 acres are owned by California. The Plan Area is shown in Figure 1-2 in Chapter 1 of this DEIS.



## ES-5 PUBLIC SCOPING ISSUES

During the public scoping process for the DEIS, the following issues, concerns, and opportunities were raised:

- Level or levels of allowable recreation at the ISDRA
- Management of OHV recreation
- Facility development and access
- Management of vendors/concessionaires
- Tour bus impacts
- Conservation of unique natural resources
- Provision of public information and resource interpretation
- Use of education and enforcement techniques to ensure regulatory compliance
- Definition of “Visitor Supply” at the ISDRA and actions taken when supply is exceeded
- Management of legal and illegal motorized trespass in the North Algodones Dunes Wilderness Area
- Future for the Fee Demo program
- Budget priorities
- Effect of closures on economy and recreation-related opportunities
- Management of noxious weeds
- Management of ISDRA to meet air quality standards

## ES-6 PROJECT ALTERNATIVES

The process used in developing the project alternatives included the review and analysis of the purpose and need for the project and oral and written comments received during public scoping. Four project alternatives, which represent the reasonable range of alternatives for purposes of NEPA, are considered in detail in this DEIS:

- Alternative 1: No Action Alternative
- Alternative 2: Recreation and Resource Protection Alternative
- Alternative 3: Natural and Cultural Resource Alternative
- Alternative 4: Motorized Recreation Opportunities Alternative



Additional alternatives were considered; those eliminated from detailed evaluation are also described in Chapter 2. This DEIS compares the Proposed Action and the other three action alternatives against Alternative 1, as required by NEPA.

The major differences between ISDRA management under Alternative 1 and the three action alternatives is the delineation of management areas, assignment of Recreation Opportunity Spectrum (ROS) classifications to those management areas (see Table ES-1), enhancement of efforts to encourage a safe and enjoyable recreational experience for the user, and emphasis on public education about OHV use in the context of the recreational, cultural, and biological resources of the area. Where facilities are planned, and where law enforcement is planned to be increased, these actions are proposed to enhance public safety in the context of an enjoyable recreational experience.

**Table ES-1 Definition of Recreation Opportunity Spectrum Classifications**

ROS CLASS	BRIEF DESCRIPTION
Primitive (P)	<ul style="list-style-type: none"> <li>• Principally unmodified natural environment of a fairly large size</li> <li>• Low visitor use</li> <li>• Facilities only for resource protection</li> <li>• No motorized use</li> </ul>
Semi-Primitive Non-Motorized (SPNM)	<ul style="list-style-type: none"> <li>• Predominantly unmodified natural environment of moderate-to-large size</li> <li>• Low visitor use, but often other area users are evident</li> <li>• Facilities provided for the protection of resource values and the safety of users</li> <li>• Motorized use is not generally allowed</li> </ul>
Semi-Primitive Motorized (SPM)	<ul style="list-style-type: none"> <li>• Same as Semi-Primitive Non-Motorized except that motorized use is allowed</li> </ul>
Roaded Natural (RN)	<ul style="list-style-type: none"> <li>• Resource modification, but harmonize with natural environment</li> <li>• Low-to-moderate visitor use</li> <li>• Onsite controls and restrictions offer a sense of security</li> <li>• Rustic facilities</li> <li>• Facilities are sometimes provided for group activity</li> <li>• Conventional motorized use in construction standards and design of facilities</li> </ul>
Rural (R)	<ul style="list-style-type: none"> <li>• Substantially modified natural environment</li> <li>• Moderate-to-high visitor use concentration to high</li> <li>• Large number of facilities designed for use by many people</li> <li>• Developed sites, roads, and trails are designed for moderate to high use</li> <li>• Moderate densities are provided far away from developed sites</li> <li>• Facilities for intensive motorized use are available</li> </ul>



**Table ES-1 Definition of Recreation Opportunity Spectrum Classifications**

ROS CLASS	BRIEF DESCRIPTION
Urban (U)	<ul style="list-style-type: none"> <li>• Substantially urbanized environment</li> <li>• Vegetative cover is often exotic and manicured</li> <li>• Large numbers of users can be expected both onsite and in nearby areas</li> <li>• Facilities for highly intensified motor use and parking are available</li> </ul>

### **ES-6.1 No Action Alternative (Alternative 1)**

Under Alternative 1, the ISDRA would continue to be managed according to the existing and approved management plan and policies (e.g., the 1987 RAMP). In addition, Alternative 1 would include compliance with policies and management measures instituted since the 1987 RAMP was first implemented. The CDCA Plan would not be amended under this alternative, and no adaptive management program would be implemented. In addition, the management areas, and associated ROS classifications, which would apply to the action alternatives (see Section ES-6.2), would not be created.

### **ES-6.2 Action Alternatives (Alternatives 2, 3, and 4)**

Management actions that are common to all the action alternatives are listed in Table ES-2. ROS classifications for each action alternative are listed in Table ES-3. Additional attributes of the project alternatives are summarized in more detail in Chapter 2 of this DEIS.

**Table ES-2 Common Management Actions Applicable to Action Alternatives**

RESOURCE AREA	MANAGEMENT ACTION
Recreation	Maintain and manage ISDRA as a unique recreational locale
Public Outreach	Develop a public relations program on cultural and natural resources; safety
Biological Resources	Manage using principles of adaptive management
Air Quality	Implement dust control measures on wash roads and install air monitoring equipment
Transportation/Traffic	Grade roads and implement fee entry and construct traffic control
Public Safety	<ul style="list-style-type: none"> <li>• Create a law enforcement cooperative team</li> <li>• Increase permanent staff and holiday staff to address the increases in visitor use of major holidays</li> <li>• Ban alcohol outside camping areas</li> <li>• Establish a sundown to sunup closure at Competition Hill north and south, Oldsmobile Hill, Test Hill, and Patton Valley</li> <li>• Post speed limits</li> <li>• Develop and maintain radio system</li> <li>• Continue existing condition of dispatching duties from Cahuilla Ranger Station</li> </ul>



Table ES-2 Common Management Actions Applicable to Action Alternatives

RESOURCE AREA	MANAGEMENT ACTION
Visitor Use	<ul style="list-style-type: none"> <li>Establish ROS classifications and visitor use targets for management areas</li> <li>Limit ISDRA use of OHVs if visitation exceeds proposed ROS classifications</li> </ul>
Land Use	Establish management areas with specific ROS classifications
Commercial	<ul style="list-style-type: none"> <li>Allow vending from October 1 through May 31 on Friday through Sunday</li> <li>Nonrecreational commercial activities not allowed during holidays</li> </ul>
Access and Facilities Development	<ul style="list-style-type: none"> <li>Develop or retrofit facilities as necessary</li> <li>Ensure that little or no development occurs in primitive areas</li> <li>Construct disability compliant trash collection facilities (and loading docks)</li> </ul>
Fiscal	<ul style="list-style-type: none"> <li>Collect fees in all areas based on demand and cost recovery</li> <li>Review price structure every 2 years</li> <li>Update fee business plan within 2 years of Record of Decision (ROD)</li> </ul>

Table ES-3 ROS Classifications Proposed for Action Alternatives

MANAGEMENT AREAS	ALTERNATIVE 2: RECREATION AND RESOURCE PROTECTION	ALTERNATIVE 3: NATURAL AND CULTURAL RESOURCE	ALTERNATIVE 4: MOTORIZED RECREATION OPPORTUNITIES
Mammoth	Semi-Primitive Motorized	Semi-Primitive Non-Motorized	Roaded Natural
North Algodones Dunes	Semi-Primitive Non-Motorized	Semi-Primitive Non-Motorized	Semi-Primitive Non-Motorized
Gecko	Rural	Roaded Natural	Urban
Glamis	Roaded Natural	Semi-Primitive Motorized	Rural
Adaptive Management	Semi-Primitive Motorized	Semi-primitive Non-Motorized	Roaded Natural
Ogilby	Roaded Natural	Semi-Primitive Motorized	Rural
Dune Buggy Flats	Roaded Natural	Semi-Primitive Motorized	Rural
Buttercup	Rural	Roaded Natural	Urban
Buffer	Semi-Primitive Motorized	Semi-Primitive Non-Motorized	Semi-Primitive Motorized



## ES-7 PREFERRED ALTERNATIVE

A Preferred Alternative is not identified in this DEIS. The Preferred Alternative will be identified in the Final EIS, after the lead agency has had the opportunity to review comments on the DEIS.

## ES-8 SUMMARY OF IMPACTS

This section presents Table ES-5, a comparative summary of the environmental consequences of implementing the project alternatives on the resources listed below. The affected environment for each of these resource areas is presented in Chapter 3, Affected Environment.

- Recreation Resources
- Biological Resources
- Law Enforcement and Public Safety
- Socioeconomics
- Land Use and Land Ownership
- Visual Resources
- Water Resources
- Cultural Resources
- Transportation and Traffic
- Noise
- Air Quality
- Hazardous Materials
- Geology, Energy, and Mineral Resources

The environmental consequences are evaluated and discussed in more detail in Chapter 4, Environmental Consequences, and Chapter 5, Cumulative Effects, of this DEIS.

### ES-8.1 Cumulative Impacts

Chapter 5, Cumulative Effects, addresses potential cumulative impacts to the environment associated with implementation of the project alternatives in concert with one or more other past, present, and reasonably foreseeable future actions and projects. As described in Chapter 4, Environmental Consequences, the individual impacts of each project alternative will vary based on the proposed area of disturbance and type and intensity of allowable recreational activities of each alternative. Table ES-4 summarizes the overall, potential cumulative impacts from the project alternatives when implemented in combination with other management strategies on public and private lands and other development projects.



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**Table ES-4 Summary of Cumulative Impacts**

RESOURCE AREA	CUMULATIVE IMPACT <sup>1</sup>
Recreation Resources	Increased demand of OHV opportunities on public lands and the potential for overcrowding at other OHV-accessible public areas across the desert Southwest
Socioeconomics	Potential reduction in the number of visitors at publicly owned recreation areas, thereby adversely affecting the regional economy in the CDCA
Remaining Resource Areas	No cumulative impacts.

<sup>1</sup>The cumulative impacts resulting from implementation of each project alternative will vary based on the proposed area of disturbance and type and intensity of allowable recreational activities of each alternative.



Table ES-5 Summary of Impacts and Mitigation Measures for the Project Alternatives

IMPACT/MITIGATION	ALTERNATIVE 1: NO ACTION	ALTERNATIVE 2: RECREATION AND RESOURCE PROTECTION	ALTERNATIVE 3: NATURAL AND CULTURAL RESOURCE	ALTERNATIVE 4: MOTORIZED RECREATION OPPORTUNITIES
<b>RECREATION RESOURCES (SECTION 4.1)</b>				
Impact	<p>Implementation of this alternative would provide for some recreation improvements, as outlined in the 1987 RAMP. These improvements would provide benefits to the recreationists who visit those areas.</p> <p>Increased visitor use would present management challenges for ISDRA staff, and potentially affects public safety and the quality and type of recreation experience provided at ISDRA (see Section 4.3, Law Enforcement and Public Safety). As more recreationists visit ISDRA simultaneously, the recreation experience changes to become more urban in character, and could result in compatibility impacts among recreationists at ISDRA.</p>	<p>The conservation of unique recreation opportunities afforded by ISDRA, such as those associated with the Semi-Primitive Motorized and Roded Natural ROS classes, is considered a beneficial impact.</p> <p>Total visitor supply over the course of the season is expected to be sufficient to meet projected demand. Management actions that result in the distribution of visits to non-holiday weekends would not adversely impact the recreation experience at ISDRA.</p> <p>Osborne Overlook would be closed to camping with implementation of this alternative. This would eliminate a recreational benefit that is offered by the baseline condition.</p> <p>Beneficial impacts to recreation resources will result from facility development. This includes pit toilet facilities in Glamis Flats, The Washes, and Dune Buggy Flats, interpretive facilities, parking, and a law enforcement facility in Buttercup, and updating the kiosks at the Wildlife Viewing.</p>	<p>The conservation of unique recreation opportunities afforded by ISDRA, such as those associated with the Semi-Primitive Motorized and Roded Natural ROS classes, is considered a beneficial impact.</p> <p>The estimate of future visits would exceed the annual visitor supply and not all recreationists desiring to attend ISDRA could be accommodated. This is considered an adverse impact.</p> <p>Osborne Overlook would be closed to camping with implementation of this alternative. This would eliminate a recreational benefit that is offered by the baseline condition.</p> <p>Beneficial impacts to recreation resources will result from facility development. This includes pit toilet facilities in Glamis Flats, The Washes, and Dune Buggy Flats, interpretive facilities, parking, and a law enforcement facility in Buttercup, and updating the kiosks at the Wildlife Viewing.</p>	<p>The conservation of unique recreation opportunities afforded by ISDRA, such as those associated with the Rural, Roded Natural, and Semi-Primitive Motorized ROS classes, is considered a beneficial impact.</p> <p>Total visitor supply would be greater under this Alternative than under Alternatives 2 and 3. The total visitor supply over the course of the season would be sufficient to meet projected demand. Management actions that result in the distribution of visits to non-holiday weekends would not adversely impact the recreation experience at ISDRA.</p> <p>This alternative would not include updating the kiosks at the Wildlife Viewing Area; therefore, no recreational benefit in this location would be recognized by visitors.</p> <p>Osborne Overlook would remain open to camping with implementation of this alternative, and certain improvements would be completed. This would result in a recreational benefit to visitors.</p> <p>In the Buttercup Management Area, interpretive facilities and</p>



## Executive Summary

**Table ES-5 Summary of Impacts and Mitigation Measures for the Project Alternatives**

IMPACT/MITIGATION	ALTERNATIVE 1: NO ACTION	ALTERNATIVE 2: RECREATION AND RESOURCE PROTECTION	ALTERNATIVE 3: NATURAL AND CULTURAL RESOURCE	ALTERNATIVE 4: MOTORIZED RECREATION OPPORTUNITIES
				parking would be developed near Grays Well Road and a law enforcement facility would be constructed. In the Glamis Management Area, new campgrounds, camping pads, pit toilet facilities, trash stations, and information kiosks would be provide. These additional facilities would result in a beneficial impact.
Mitigation Measures	The expected growth in visitation would require more law enforcement personnel, medical services personnel, recreation staff, and associated resources to manage the increased number of visitors.			
<b>BIOLOGICAL RESOURCES (SECTION 4.2)</b>				
Habitat Types				
Impact	Impacts expected to continue similar to baseline conditions.	Based on projected visitor use increases, impacts to habitat are expected to decrease relative to the baseline. However, impacts to habitat within the Adaptive and Buffer Zone Management Areas are expected to substantially decrease relative to the baseline. Because OHV use would be controlled within the Adaptive Management Area, minor impacts to habitat are anticipated.	Based on the projected slight increase in visitor use, and ROS class impacts to habitats are expected to decrease relative to the baseline. Minor facility development, campground improvements, and road maintenance are anticipated to result in similar, but lessened, impacts. However, no impacts to habitat are expected within the Mammoth, North Algodones Dunes Wilderness, Buffer Zone, and Adaptive Management Areas due to the closures.	Based on the projected visitor use increases and ROS classifications, impacts to habitats are expected to increase. Increased facility development, campground improvements, and road maintenance are anticipated to result in increased impacts. With the ROS designation of the Glamis Management Area as Roaded Rural and Adaptive Management Area as Roaded Natural, impacts to habitat are anticipated to increase in these management areas.



Table ES-5 Summary of Impacts and Mitigation Measures for the Project Alternatives

IMPACT/MITIGATION	ALTERNATIVE 1: NO ACTION	ALTERNATIVE 2: RECREATION AND RESOURCE PROTECTION	ALTERNATIVE 3: NATURAL AND CULTURAL RESOURCE	ALTERNATIVE 4: MOTORIZED RECREATION OPPORTUNITIES
Mitigation Measures	No use of Adaptive Management to monitor and, if necessary, to reduce impacts. Standard construction mitigation measures would apply.	Enforcement of the Adaptive and Buffer Zone Management Areas would include installation and maintenance of signage as well as Ranger patrols. Use of Adaptive Management to monitor and, if necessary, reduce impacts would be implemented. Standard construction mitigation measures would apply.	Enforcement of the closures would include installation and maintenance of signage as well as increased Ranger patrols. Use of Adaptive Management to monitor and, if necessary, reduce impacts would be implemented. Standard construction mitigation measures would apply.	Use of Adaptive Management to monitor and, if necessary, reduce impacts would be implemented. Standard construction mitigation measures would apply.
<b>Special-Status Plants</b>				
Impact	No expected increase in impacts relative to the baseline.	Based on the projected visitor use increases and ROS classifications, impacts to special-status plants are expected to decrease relative to the baseline. Impacts to special-status plants within the Adaptive and Buffer Zone Management Areas are expected to substantially decrease relative to the baseline. Because OHV use would be controlled within the Adaptive Management Area, minor impacts to special-status plants are anticipated.	Based on the projected slight increases in visitor use, impacts to special-status plants are expected to decrease relative to the baseline. Minor facility development, campground improvements, and road maintenance are anticipated to result in similar, but lessened, impacts relative to the baseline. However, no impacts to special status plants are expected within the Mammoth, North Algodones Dunes Wilderness, Buffer Zone, and Adaptive Management Areas due to the closures.	Impacts would increase relative to the baseline. Substantially increased facility development, campground improvements, and road maintenance are anticipated to result in substantially increased impacts. With the ROS designation of the Glamis Management Area as Rural and the Adaptive Management Area as Roaded Natural, impacts to special-status plants are anticipated to increase in these management areas.
Mitigation Measures	No use of Adaptive Management to monitor and, if necessary, reduce impacts. Standard mitigation measures would apply.	Enforcement of the Adaptive and Buffer Zone Management Areas would include installation and maintenance of signage as well as Ranger patrols. Use of Adaptive Management to monitor and, if necessary, reduce impacts would be implemented. Standard construction mitigation measures would apply.	Enforcement of the closures would include installation and maintenance of signage as well as increased Ranger patrols. Use of Adaptive Management to monitor and, if necessary, reduce impacts would be implemented. Standard construction mitigation measures would apply.	Use of Adaptive Management to monitor and, if necessary, reduce impacts would be implemented. Standard construction mitigation measures would apply.



Table ES-5 Summary of Impacts and Mitigation Measures for the Project Alternatives

IMPACT/MITIGATION	ALTERNATIVE 1: NO ACTION	ALTERNATIVE 2: RECREATION AND RESOURCE PROTECTION	ALTERNATIVE 3: NATURAL AND CULTURAL RESOURCE	ALTERNATIVE 4: MOTORIZED RECREATION OPPORTUNITIES
<b><i>Special-Status Wildlife</i></b>				
Impact	No expected increase in impacts relative to the baseline.	Similar relative decrease in impacts as described for special status plants.	Similar relative decrease in impacts as described for special status plants.	Similar relative increase in impacts as described for special status plants.
Mitigation Measures	No use of Adaptive Management to monitor and, if necessary, reduce impacts. Standard mitigation measures would apply.	Similar mitigation measures as described for special status plants.	Similar mitigation measures as described for special-status plants.	Similar mitigation measures as described for special-status plants.
<b>LAW ENFORCEMENT AND PUBLIC SAFETY (SECTION 4.3)</b>				
Impact	Illegal /anti-social and dangerous behavior would continue or increase and less-than-optimal emergency response times would remain the same or increase in length due to current limited law enforcement staff.	Beneficial impact to public safety as a result of more focused allocation of law enforcement staff and enforcement of proposed management actions (e.g. posting speed limits, banning of alcohol outside camping areas, building an additional ranger station, and other management actions designed to maximize public safety). However changes in visitor use patterns requiring correlation to staffing levels would result from implementation of proposed management actions are expected.	Similar beneficial impact to public safety as compared to Alternative 2 as a result of increased patrols and law enforcement presence and enforcement of proposed management actions	Potential adverse effects to public safety if increases in permanent law enforcement staff are not increased relative to visitor use patterns.
Mitigation Measures	None required.	None required.	None required.	None required.



Table ES-5 Summary of Impacts and Mitigation Measures for the Project Alternatives

IMPACT/MITIGATION	ALTERNATIVE 1: NO ACTION	ALTERNATIVE 2: RECREATION AND RESOURCE PROTECTION	ALTERNATIVE 3: NATURAL AND CULTURAL RESOURCE	ALTERNATIVE 4: MOTORIZED RECREATION OPPORTUNITIES
<b>SOCIOECONOMICS (SECTION 4.4)</b>				
Impact	<p><u>Imperial County:</u> Estimated trip expenditures range from \$142.6 million to \$352.8 million. The ISDRA would contribute 2,897 to 7,790 in direct employment and between \$56.8 million and \$140.4 million in direct personal income to the County economy. Visitor expenditures result in 287 to 727 in indirect employment and between 394 and 978 in induced employment. The visitor expenditures would also generate between \$8.6 million and \$21.6 million in indirect personal income and between \$9.7 million and \$24.2 million in induced personal income.</p> <p><u>Yuma County:</u> Estimated trip expenditures range from \$6.7 million to \$16.6 million. The ISDRA would contribute 137 to 377 in direct employment and between \$2.3 million and \$5.8 million in direct personal income to the Yuma County economy. Visitor expenditures result in 23 to 57 in indirect employment in the region and between 21 and 54 in induced employment. The visitor expenditures also generate between \$0.5 million and \$1.4 million in indirect personal income to the region, and between \$0.5 million and</p>	<p><u>Imperial County:</u> Estimated trip expenditures range from \$112.8 million to \$278.9 million. The ISDRA would contribute 2,290 to 6,158 in direct employment and between \$44.9 million and \$111.0 million in direct personal income. Visitor expenditures result in 227 to 574 in indirect employment and between 312 and 773 in induced employment. The visitor expenditures would also generate between \$6.8 million and \$17.0 million in indirect personal income and between \$7.7 million and \$19.1 million in induced personal income.</p> <p><u>Yuma County:</u> Estimated trip expenditures range from \$5.3 million to \$13.1 million. The ISDRA would contribute 108 to 298 in direct employment and between \$1.8 million and \$4.6 million in direct personal income. Visitor expenditures result in 18 to 45 in indirect employment and between 17 and 42 in induced employment. The visitor expenditures also generate between \$0.4 million and \$1.1 million in indirect personal income and between \$0.4 million and \$0.9 million in induced personal income.</p> <p>The anticipated increase in regional employment and income</p>	<p><u>Imperial County:</u> Estimated trip expenditures range from \$102.5 million to \$253.5 million. The ISDRA would contribute 2,081 to 5,597 in direct employment and between \$40.8 million and \$100.9 million in direct personal income. Visitor expenditures result in 283 to 522 in indirect employment in the region and between 283 and 703 in induced employment. The visitor expenditures would also generate between \$6.1 million and \$15.5 million in indirect personal income and between \$7.0 million and \$17.4 million in induced personal income.</p> <p><u>Yuma County:</u> Estimated trip expenditures range from \$4.8 million to \$11.9 million. The ISDRA would contribute 99 to 271 in direct employment and between \$1.7 million and \$4.2 million in direct personal income. Visitor expenditures result in 16 to 41 in indirect employment and between 15 and 39 in induced employment. The visitor expenditures also generate between \$0.4 million and \$1.0 million in indirect personal income and between \$0.3 million and \$0.8 million in induced personal income.</p> <p>The anticipated increase in regional employment and income</p>	<p><u>Imperial County:</u> Estimated trip expenditures range from \$124.0 million to \$306.6 million. The ISDRA would contribute 2,518 to 6,771 in direct employment and between \$49.4 million and \$122.1 million in direct personal income. Visitor expenditures result in 250 to 632 in indirect employment and between 343 and 850 in induced employment. The visitor expenditures would also generate between \$7.4 million and \$18.7 million in indirect personal income and between \$8.5 million and \$21.0 million in induced personal income.</p> <p><u>Yuma County:</u> Estimated trip expenditures range from \$5.8 million to \$14.5 million. The ISDRA would contribute 119 to 328 in direct employment and between \$2.0 million and \$5.1 million in direct personal income. Visitor expenditures result in 20 to 50 in indirect employment in the region and between 19 and 47 in induced employment. The visitor expenditures also generate between \$0.5 million and \$1.2 million in indirect personal income and between \$0.4 million and \$1.0 million in induced personal income.</p>



Table ES-5 Summary of Impacts and Mitigation Measures for the Project Alternatives

IMPACT/MITIGATION	ALTERNATIVE 1: NO ACTION	ALTERNATIVE 2: RECREATION AND RESOURCE PROTECTION	ALTERNATIVE 3: NATURAL AND CULTURAL RESOURCE	ALTERNATIVE 4: MOTORIZED RECREATION OPPORTUNITIES
	\$1.2 million in induced personal income.  The anticipated increase in regional employment and income in Imperial and Yuma Counties represents a beneficial impact.	in Imperial and Yuma Counties represents a beneficial impact.	in Imperial and Yuma Counties represents a beneficial impact.	The anticipated increase in regional employment and income in Imperial and Yuma Counties represents a beneficial impact.
Mitigation Measures	None required.	None required.	None required.	None required.
<b>LAND USE AND LAND OWNERSHIP (SECTION 4.5)</b>				
Impact	No impact.	No impact.	Inconsistency with CDCA Plan.	Inconsistency with CDCA Plan.
Mitigation Measures	None required.	None required.	None required.	None required.
<b>VISUAL RESOURCES (SECTION 4.6)</b>				
Impact	No impacts anticipated.	Updating kiosks at the Wildlife Viewing Area and reducing dust through application of a palliative on Wash Road would provide beneficial visual impacts. Development of new facilities would be consistent with existing Visual Resource Management (VRM) categories and would not adversely impact visual resources at ISDRA.	Same as Alternative 2.	Same as Alternative 2.
Mitigation Measures	None required.	The following measures should be applied to all new facilities and physical improvements in the ISDRA to ensure they harmonize with the natural landscape. <ul style="list-style-type: none"> <li>Within the North Algodones Dunes Wilderness Areas, no improvements to roadways, new interpretive signs and kiosks, or establishment of vendor areas should occur in this VRM Class 1 area.</li> </ul>	Same as Alternative 2.	Same as Alternative 2.



Table ES-5 Summary of Impacts and Mitigation Measures for the Project Alternatives

IMPACT/MITIGATION	ALTERNATIVE 1: NO ACTION	ALTERNATIVE 2: RECREATION AND RESOURCE PROTECTION	ALTERNATIVE 3: NATURAL AND CULTURAL RESOURCE	ALTERNATIVE 4: MOTORIZED RECREATION OPPORTUNITIES
		<ul style="list-style-type: none"> <li>When updating the kiosks at the Wildlife Viewing Area in the VRM Class 1 area (North Algodones Dunes Wilderness Area), use materials that harmonize with the natural landscape.</li> <li>Additional interpretive signs, kiosks, and vendor areas should occur in VRM Class 3 or 4 areas only. By definition, interpretive signs and kiosks and vendor areas should attract attention; therefore, they should not be developed in Class 1 or 2 areas.</li> </ul>		
<b>WATER RESOURCES (SECTION 4.7)</b>				
<b>Surface Water</b>				
Impacts	No significant adverse impacts anticipated.	No significant adverse impacts anticipated.	No impacts anticipated.	No significant adverse impacts anticipated.
Mitigation Measures	None required.	None required.	None required.	None required.
<b>Groundwater</b>				
Impacts	No significant adverse impacts anticipated.	No significant adverse impacts anticipated.	No significant adverse impacts anticipated.	No significant adverse impacts anticipated.
Mitigation Measures	None required.	None required.	None required.	None required.
<b>Wildlife Guzzler</b>				
Impacts	Potential adverse impact to surface wildlife guzzlers due to lack of management response to increased visitation.	Potential adverse impact to surface wildlife guzzlers would be less than under Alternative 1 due to the application of management procedures to address increased visitation.	No impact: areas with wildlife guzzlers would be closed to OHV use.	No impact: areas with wildlife guzzlers would be closed to OHV use.



Table ES-5 Summary of Impacts and Mitigation Measures for the Project Alternatives

IMPACT/MITIGATION	ALTERNATIVE 1: NO ACTION	ALTERNATIVE 2: RECREATION AND RESOURCE PROTECTION	ALTERNATIVE 3: NATURAL AND CULTURAL RESOURCE	ALTERNATIVE 4: MOTORIZED RECREATION OPPORTUNITIES
Mitigation Measures	To avoid potential adverse impacts to the two wildlife guzzlers in the Mammoth Management Area, the area in the immediate vicinity of the guzzlers, will be closed to OHV use.	To avoid potential adverse impacts to the two wildlife guzzlers in the Mammoth Management Area, the area in the immediate vicinity of the guzzlers, will be closed to OHV use.	None required.	None required.
<b>CULTURAL RESOURCES (SECTION 4.8)</b>				
Impact	Potential impacts due to the degree of access and relative area of disturbance by OHV activity would be greater than Alternatives 2 and 3, and less than Alternative 4.	Potential impacts due to the degree of access and relative area of disturbance by OHV activity would be greater than Alternative 3, and less than Alternatives 2 and 4.	Potential impacts due to the degree of access and relative area of disturbance by OHV activity would be less than all other alternatives (2, 3 and 4).	Potential impacts due to the degree of access and relative area of disturbance by OHV activity would be greater than all other alternatives (1, 2, and 3).
Mitigation Measures	Potential impacts to cultural resources will be addressed under the 1997 BLM National Protocol Agreement (NPA), supported by the State Protocol Agreement between the California Director of the BLM and the State Historic Preservation Officer (SHPO). Under the NPA and State Protocol Agreement, BLM will meet National Historic Preservation Act requirements for addressing effects to historic properties.	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1
<b>TRANSPORTATION AND TRAFFIC (SECTION 4.9)</b>				
Impact	Impacts during future peak-hour traffic on major holidays would be adverse, but not significant.	Potential adverse impacts during future peak-hour traffic on major holidays would be less than under Alternative 1.	Potential adverse impacts during future peak-hour traffic on major holidays would be less than under Alternatives 1 and 2.	Potential adverse impacts during future peak-hour traffic on major holidays would be less than under Alternative 1, and greater than Alternatives 2 and 3.



Table ES-5 Summary of Impacts and Mitigation Measures for the Project Alternatives

IMPACT/MITIGATION	ALTERNATIVE 1: NO ACTION	ALTERNATIVE 2: RECREATION AND RESOURCE PROTECTION	ALTERNATIVE 3: NATURAL AND CULTURAL RESOURCE	ALTERNATIVE 4: MOTORIZED RECREATION OPPORTUNITIES
Mitigation Measures	A Traffic Control Plan (TCP) will be implemented that would include advance portable changeable message signs on the freeway and local roads to provide motorist information and direct traffic to alternative exits, as well as the dispatching of Rangers and California Highway Patrol officers to freeway exits and intersections along access routes to direct traffic and provide quick response to traffic incidents.			
<b>NOISE (SECTION 4.10)</b>				
Impact	Short-term construction noise and long-term higher ambient noise levels resulting from increased OHV activity would not affect any sensitive noise receptors, and no adverse impacts would result.	Short-term construction noise would be temporary and would not affect any sensitive noise receptors. Long-term ambient noise levels would be less than under Alternative 1, and would not affect sensitive noise receptors. No adverse impacts would result.	Short-term construction noise would be temporary and would not affect any sensitive noise receptors. Long-term ambient noise levels would be less than under Alternatives 1 and 2, and would not affect sensitive noise receptors. No adverse impacts would result.	Short-term construction noise would be temporary and would not affect any sensitive noise receptors. Long-term ambient noise levels would be less than under Alternative 1, and greater than under Alternative 2 and 3. No adverse impacts would result.
Mitigation Measures	None required.	None required.	None required.	None required.
<b>AIR QUALITY (SECTION 4.11)</b>				
<i>Annual Emissions</i>				
Impact	Total net emissions would exceed <i>de minimis</i> threshold levels	Net change in annual emissions would be below <i>de minimis</i> threshold levels, and less than under Alternative 1.	Net change in annual emissions would be below <i>de minimis</i> threshold levels, and less than under Alternatives 1 and 2.	No change in net emissions, and no exceedance of <i>de minimis</i> threshold levels. Emissions would be greater than under Alternative 2 and 3, and less than under Alternative 1.
Mitigation Measures	<ul style="list-style-type: none"> <li>Apply nontoxic chemical soil stabilizers to all active staging areas (unpaved</li> </ul>	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1



Table ES-5 Summary of Impacts and Mitigation Measures for the Project Alternatives

IMPACT/MITIGATION	ALTERNATIVE 1: NO ACTION	ALTERNATIVE 2: RECREATION AND RESOURCE PROTECTION	ALTERNATIVE 3: NATURAL AND CULTURAL RESOURCE	ALTERNATIVE 4: MOTORIZED RECREATION OPPORTUNITIES
	graded areas for OHV and visitors' parking). <ul style="list-style-type: none"> <li>• Pave parking lots and access roads at least 100 feet onto the site from main road or highway.</li> <li>• Reduce traffic speeds on all unpaved roads to 15 mph or less.</li> <li>• Suspend all operations when wind speeds exceed 25 mph.</li> <li>• Sweep all paved streets once a day if visible sand materials are carried to adjacent streets</li> <li>• Configure access roads and parking lots to minimize traffic interference and idle exhaust emission.</li> <li>• Provide temporary traffic control during peak OHV activities to improve traffic flow (e.g., flagperson).</li> <li>• Suspend all OHV operations during second-stage smog alerts.</li> </ul>			
<b>Peak Daily Emissions</b>				
Impact	Increased emissions would exceed Imperial County Pollution Control District (IACPD) daily threshold criteria.	Net peak daily emissions would be below IACPD daily threshold criteria, and less than under Alternative 1.	Net peak daily emissions would not exceed IACPD daily threshold criteria, and would be less than under Alternatives 1 and 2.	No change in net emissions, and no exceedance of IACPD daily threshold criteria. Emissions would be greater than under Alternative 2 and 3, and less than under Alternative 1.
Mitigation Measures	See mitigation provided above for annual emissions.	See mitigation provided above for annual emissions.	See mitigation provided above for annual emissions.	See mitigation provided above for annual emissions.



Table ES-5 Summary of Impacts and Mitigation Measures for the Project Alternatives

IMPACT/MITIGATION	ALTERNATIVE 1: NO ACTION	ALTERNATIVE 2: RECREATION AND RESOURCE PROTECTION	ALTERNATIVE 3: NATURAL AND CULTURAL RESOURCE	ALTERNATIVE 4: MOTORIZED RECREATION OPPORTUNITIES
<b>HAZARDOUS MATERIALS (SECTION 4.12)</b>				
Impacts	Potential adverse impact relating to accidental spills of fuels, oils, grease and other OHV-related substances.	Potential adverse impact relating to accidental spills of fuels, oils, grease and other OHV-related substances would be less than under Alternative 1.	Potential adverse impact relating to accidental spills of fuels, oils, grease and other OHV-related substances would be less than under Alternatives 1 and 2.	Potential adverse impact relating to accidental spills of fuels, oils, grease and other OHV-related substances would be less than under Alternative 1, and greater than Alternatives 2 and 3.
Mitigation Measures	No significant impacts are anticipated. However, the BLM would provide education materials relating to the storage and use of hazardous materials related to OHV recreational use. Examples include educational materials and/or kiosks for the storage, handling, and disposal of hazardous materials in accordance with manufacturers' directions.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
<b>GEOLOGY, ENERGY, AND MINERAL RESOURCES (SECTION 4.13)</b>				
<i>Soils and Geology</i>				
Impact	Erosion impacts resulting from OHV activities would be greater for Alternative 1 than under Alternatives 2 and 3 and less than under Alternative 4. However, the area available for OHV use under Alternative 1 would be comparable to the baseline conditions, and the impact would be commensurate; therefore, adverse impacts are not anticipated.	The erosional impacts and soils compaction would be greater than under Alternative 3 and less than under Alternatives 1 and 4. However, the area available for OHV use would be less than baseline conditions, and the intensity of use would be more constrained. Therefore, adverse impacts are not anticipated.	The impact resulting from OHV activities, erosion and soil compaction would be less under this alternative than under any of the other alternatives. Because the impacted area and levels of intensity of use would be less than existing conditions, significant adverse impacts are not anticipated.	Impacts to soils and erosion would be greater than under any of the other alternatives. The area available for OHV use would be as great as under existing conditions, but the impacts would be greater due to a higher level of use allowed in the open areas. Therefore, adverse impacts are anticipated.



## Executive Summary

**Table ES-5 Summary of Impacts and Mitigation Measures for the Project Alternatives**

<b>IMPACT/MITIGATION</b>	<b>ALTERNATIVE 1: NO ACTION</b>	<b>ALTERNATIVE 2: RECREATION AND RESOURCE PROTECTION</b>	<b>ALTERNATIVE 3: NATURAL AND CULTURAL RESOURCE</b>	<b>ALTERNATIVE 4: MOTORIZED RECREATION OPPORTUNITIES</b>
Mitigation Measures				
<i><b>Energy Resources</b></i>				
Impact	No adverse impacts anticipated.	No adverse impacts anticipated.	No adverse impacts anticipated.	No adverse impacts anticipated.
Mitigation Measures				
<i><b>Mineral Resources</b></i>				
Impact	No adverse impacts anticipated.	No adverse impacts anticipated.	No adverse impacts anticipated.	No adverse impacts anticipated.
Mitigation Measures				
<i><b>Seismic Hazards</b></i>				
Impact	No adverse impacts anticipated.	No adverse impacts anticipated.	No adverse impacts anticipated.	No adverse impacts anticipated.
Mitigation Measure				



## CHAPTER 1.0

# INTRODUCTION



Photos taken in vicinity of  
Cahuilla Ranger Station



## Chapter 1 Introduction







## CHAPTER 1.0

# INTRODUCTION

The Bureau of Land Management (BLM) has prepared this Draft Environmental Impact Statement (DEIS) to analyze the potential environmental impacts resulting from the revision and updating of the Recreation Area Management Plan and Environmental Assessment for the Imperial Sand Dunes (BLM, 1987). A revised recreation area management plan (RAMP) would provide direction and guidance on the management of land use and resources of the Imperial Sand Dunes Recreation Area (ISDRA) that would be consistent with current public needs and resources status. Implementing a revised RAMP would also constitute an amendment to the California Desert Conservation Area (CDCA) Plan, in accordance with BLM planning regulations (43 Code of Federal Regulations [CFR] 1610.3-2). This DEIS is prepared in accordance with National Environmental Policy Act (NEPA) of 1969, as amended, the President's Council on Environmental Quality Guidelines for the implementation of NEPA, and the BLM NEPA Handbook (H-1790-1). The BLM is the lead agency for this DEIS, and maintains primary responsibility for compliance with NEPA for actions on federal lands it manages. In addition, the BLM is responsible for consulting with the United States Fish and Wildlife Service (USFWS) to ensure that the Alternative 2 complies with the Endangered Species Act (ESA). The USFWS is a cooperating agency under NEPA.

The ISDRA, which comprises the largest mass of sand dunes in California, is located in Imperial County. The ISDRA is recognized as a world-class off-highway vehicle (OHV) recreation area because of the outstanding opportunities it presents for OHV recreational activities (BLM, 1987). It is one of the most popular OHV areas in the western United States, as evidenced by over 3 million OHV visitor-use days that occur annually at the ISDRA (BLM, 2001). In addition, the ISDRA provides unique habitat for several endemic and sensitive plant, insect, and animal species.

The ISDRA provides outstanding recreation opportunities for OHV recreation to the Southern California region and vicinity. To fulfill its obligations under Federal Land Policy Management Act (FLPMA) and under the Endangered Species Act (ESA) (see Section 1.3 of this DEIS), the BLM must manage recreational use such that the conditions of special-status species, and other unique natural and cultural resources, are maintained or improved. The FLPMA directs that the BLM's management of public lands emphasize "multiple use and sustained yield unless otherwise specified by law" and that "public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental.... Values" (43 U.S.C. 1701 Sec. 102(a)(7)(8)). The type and level of OHV use, in particular, must



## Introduction

also be carefully managed to create an environment that promotes the health and safety of visitors, employees, and nearby residents.

Continued population growth in Southern California and the expanding popularity of OHV recreation has resulted in a steady increase in demand for outdoor recreation at the ISDRA. From 1985 to the present, the number of visits to the ISDRA has roughly tripled (BLM, 1987 and 2001a).

Proportionate to the increase in visitation is the increase in frequency of trespass in the North Algodones Dunes Wilderness and on private lands, which has resulted in conflicts among OHV enthusiasts, landowners, and concerned members of the public. Growing attendance also underlies, in part, the increased incidence of law enforcement violations.

This DEIS is organized in five chapters. The remainder of Chapter 1 describes the purpose and need for revising and updating the 1987 RAMP, project setting, regulatory context, project objectives, and scoping activities. Chapter 2 describes the alternatives (including the No Action and the action alternatives). The Affected Environment is described in Chapter 3, and Chapter 4 addresses and analyzes the environmental impacts of the alternatives (including the No Action Alternative). Cumulative Impacts are addressed in Chapter 5. Chapters 6, 7, 8 and 9 provide information on document authors, contacts, a glossary, and references.

### 1.1 PURPOSE AND NEED

As noted in BLM Manual 8322, a recreation area management plan....

“identifies the management actions to be implemented to achieve recreation related decisions.... (and) is the link between the allocation of land for recreation use in the multiple-use planning process and the actions necessary to implement such allocations.” (BLM Manual 8322.05A; parentheses added).

#### 1.1.1 Purpose

The purpose of revising the 1987 Recreation Area Management Plan (RAMP) is to develop a comprehensive and detailed management plan consistent with conditions and guiding statutes as they exist at the ISDRA in the early 21st Century. A revised RAMP that updates the 1987 RAMP would be designed to provide a variety of sustainable OHV and other recreational activities, and to maintain or improve the conditions of the special-status species and other unique natural and cultural resources, while creating an environment to promote the health and safety of visitors, employees, and nearby residents. The purpose and need of the BLM's proposed action is to:

- Specify what levels of visitor activities can be provided for motorized vehicle use in the ISDRA while maintaining the habitat requirements for special-status species, conserving cultural resources, providing reasonable consideration for other important natural resources, while providing for



the health and safety of visitors, nearby residents, employees and other service providers in the ISDRA.

- Institute measures to achieve desired visitor use levels, maintain habitat requirements for special-status species, conserve cultural resources, provide reasonable consideration of other important natural resources and provide for the health and safety of visitors, nearby residents, employees and other service providers in the ISDRA. A revised RAMP would establish criteria for modifying those measures or instituting additional measures if needed in the future based on levels of visitor use and the conditions and trends of special-status species, cultural resources and important natural resources.
- Identify the type and level of visitor services, including unique areas and facilities needed to support desired visitor use. For services to be provided by BLM, costs for these services will be identified; and a fee system will be established so that the appropriate level of visitor services can be provided in an efficient, cost-effective manner.
- Guide the management of the ISDRA beginning in October 2002. A recreation area management plan is normally revised every 10 years, but may continue to be used for up to 15 years. Revised plans may be amended or revised at any time if the BLM State Director determines that conditions in the ISDRA have changed beyond those anticipated by a revised Recreation Management Plan, or if monitoring or project-level environmental analysis indicate a need for a change in management direction.
- Establish priorities. Management area allocations, actions, monitoring and evaluation requirements constitute a statement of BLM's intended direction. Projected outputs, services and rates of implementation are contingent upon obtaining funding, including grants, agreements and the annual budgeting process.

### 1.1.2 Need

The need to revise the ISDRA Recreation Area Management Plan is based on changes that have occurred since 1987 that have implications for and indicate the need to revise management approaches at the ISDRA. The ISDRA offers outstanding recreational opportunities for OHV recreation in the California Desert District. To fulfill its management obligations under federal regulations, the BLM must manage OHV use so that the conditions of the special-status species, and other unique natural and cultural resources are maintained or improved. The type and level of OHV use also must be managed to create an environment that promotes the health and safety of visitors, employees, and nearby residents.

Since the previous Recreation Area Management Plan was written in 1987, several of the projects identified in that plan have been implemented. Of the projects that were not implemented, some are no longer feasible. Therefore, it



## **Introduction**

is critical for the BLM to revisit some of the past decisions and determine whether or not new courses should be charted.

In addition, since 1987 several regulatory changes have taken place that relate to the ISDRA. The USFWS listed the Peirson's milk-vetch as a federally threatened plant. The flat-tailed horned lizard has been proposed as federally threatened by USFWS. Public Law 103-433 designated the North Algodones Dunes Wilderness in 1994. Public Law 103-433 released Wilderness Study Area (WSA) 362 from further studies concerning its suitability for wilderness designation. Analyzing this new information may lead to different management decisions in the future.

Southern California's continued population growth in the urban and nonurban areas and shifting demographic patterns have increased the demand for outdoor recreation at the ISDRA and nearby areas. Related to the increased demand, the problem of trespass in the North Algodones Dunes Wilderness and private lands (both within and adjacent to the Area) has traditionally created conflicts between OHV enthusiasts, landowners and concerned members of the public. It continues to be a management challenge to encourage appropriate recreational use, discourage inappropriate use, while respecting the freedom of visitors to enjoy the ISDRA.

On the basis of the purpose and need for this action and on the issues, concerns, and opportunities that were identified during the public scoping process (see Section 1.4.2), the BLM will establish long-term goals that describe desired conditions to be achieved during the implementation period of a revised RAMP.

## **1.2 SETTING**

### **1.2.1 Regional Location**

The ISDRA is located in Imperial County, in southeastern California approximately 25 miles west of the Colorado River and immediately north of the border between the United States and Mexico. This area is shown in Figure 1-1, Regional Vicinity. Access to the ISDRA is provided primarily by State Route (SR)-78 in the north, and Interstate (I)-8 in the south. The town of Brawley is located approximately 25 miles to the west, and the City of El Centro is located 40 miles southwest. The small settlement of Glamis is located within the ISDRA where SR-78 crosses the Union Pacific (formerly the Southern Pacific) Railroad (UPRR). East of the ISDRA are the Cargo Muchacho Mountains and Chocolate Mountains. This area includes the Chocolate Mountain Aerial Gunnery Range, which is used by the U.S. military for target practice. The Salton Sea is located approximately 25 miles northwest of the ISDRA.

### **1.2.2 ISDRA Plan Area**

The Plan Area for the evaluation conducted in this DEIS encompasses the ISDRA and a buffer management area. The ISDRA comprises approximately 227,000 acres of land in California, covering an area more than 40 miles long and averaging 5 miles in width. The regional setting of the ISDRA is shown



in Figure 1-1. Of this total acreage of ISDRA (approximately 208,000 acres are managed by BLM; 16,000 acres are privately owned; 1,700 acres are owned by the United States military; and 900 acres are owned by the State of California). The dunes are bordered on the west by the Coachella Canal, which delivers Colorado River water to the agricultural industry of the Imperial Valley to the north and west. A major route of the UPRR traverse the eastern edge of the ISDRA. SR-78 divides the northern third of the ISDRA from the southern portion. Interstate 8 traverses the southern portion of the ISDRA. Ogilby Road runs north-south between SR-78 and I-8 along the southeast portion of the ISDRA. The ISDRA Plan Area is shown in Figure 1-2.

### 1.2.3 Topography

The dune system of the ISDRA is situated on a relatively flat plain that has an elevation of approximately 50 feet above sea level. On the west, the plain is referred to as the East Mesa because it is east of the Imperial Valley. On the east, the plain is called Pilot Knob Mesa. The dunes reach heights of 300 feet above the plain and include classic examples of several different types of dunes. The sands are believed to originate largely from the eroded beaches of ancient Lake Cahuilla. The beaches themselves are remnants from times when the Colorado River temporarily was diverted from its southward course, and emptied into the Salton Trough, forming ancient Lake Cahuilla. Unlike some major dune systems that have formed next to a mountain range as a result of blocking topography, the Imperial Sand Dunes (also known as the Algodones Dunes) have formed primarily as a result of opposing seasonal winds. Winter winds come from the northwest, but often reverse to the southeast in summer. The stronger winter winds bring sands from the Salton Trough, and appear to be slowly pushing the dune system southeastward.

Largely as a result of the dominance of northwesterly winds, the east and west portions of the dune system differ substantially in character. West side sands are composed of material that is generally heavier and coarser than the lighter, finer sands carried further east and south by the prevailing winds. The coarse sands form the largest, tallest dunes, located in the western two-thirds of the dune system and constitute the “primary dunes.” The tallest dunes are found toward the center of the overall dune mass, in the eastern half of the primary dune area. East of the primary dunes are the “secondary dunes,” smaller dunes composed of finer sands and having more vegetation cover.

### 1.2.4 Climate

The ISDRA is located in a desert region of long, hot summers; mild winters; low rainfall; low relative humidity; and a high percent of sunny days. Summer daytime temperatures routinely exceed 105 degrees Fahrenheit (°F). Annual precipitation fluctuates widely but averages just over 2 inches. Winter daytime highs are in the 60°F to 70°F range from December through March, and freezing temperatures are rare. Winter winds approach from the northwest. Summer winds are more variable, but often blow from the southeast.



### 1.2.5 Visitor Use Patterns

Visitation to the ISDRA has increased dramatically since 1987. Data from 1987 Recreation Area Management Plan indicate that approximately 225,900 visits were made to the ISDRA in 1985. In comparison, visits to the ISDRA during the last 2 years have averaged more than 750,000 visits per year. Visitor use patterns are discussed throughout Chapters 3 and 4 of this DEIS as they pertain to the affected environment and environmental impacts.

## 1.3 RELATIONSHIP TO POLICIES, PLANS, AND PROGRAMS

Implementation of a revised management plan for public lands is subject to numerous laws and regulations, and well as a general requirement for consistency with pre-existing and applicable plans. The following sections summarize the most pertinent policies, plans, and programs that affect planning processes at the ISDRA.

### 1.3.1 Federal Land Policy Management Act

The Federal Land Policy Management Act (P.L. 94-579, 90 Stat. 2743, 43 U.S.C. 1701 et seq.) provides the BLM with an operating mandate to emphasize the concepts of multiple use and sustained yield. Section 202(c) of FLPMA requires the BLM to “use and observe the principles of multiple use and sustained yield” in developing land use plans for public lands. Multiple use is a concept that directs public lands and their resource values be managed in a way that best meets the present and future needs of the people of the county. Multiple use involves “a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources...” (FLPMA, Section 103). Sustained yield is “the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the public lands consistent with multiple use” (FLPMA, Section 103). The BLM is directed by FLPMA to manage sustained yield consistently with multiple use. The California Desert Conservation Area (see Section 1.3.2) was created through Section 601 of FLPMA.

### 1.3.2 California Desert Conservation Area Plan

The CDCA encompasses 25 million acres of land in Southern California that was designated by Congress in 1976 through FLPMA. The BLM directly administers about 10 million acres of the CDCA. With the designation of the CDCA, Congress directed the BLM to prepare and implement a comprehensive, long-range plan for the management, use, development, and protection of public lands within the CDCA. The 1980 CDCA Plan, as amended, is based on the concepts of multiple use, sustained yield, and maintenance of environmental quality. The CDCA Plan provides overall regional guidance for management of the public lands in CDCA, and establishes long-term goals for protection and use of the California Desert. The CDCA Plan establishes four multiple-use classes, multiple-use class guidelines, and plan elements for specific resources or activities such as motorized-vehicle access, recreation, and vegetation. These multiple-use classes (MUCs) are:



- Class C (Controlled): About 4 million acres are Class C. These include 69 wilderness areas totaling 3,667,020 acres created by Congress with the October 1994 passage of the California Desert Protection Act (CDPA). These lands are to be preserved in a natural state; and access generally is limited to Non-Motorized, nonmechanized means (i.e., by foot or horseback).
- Class L (Limited Use): About 4 million acres are Class L. These lands are managed to protect sensitive, natural, scenic, ecological, and cultural resource values. They provide for generally lower-intensity, carefully controlled multiple uses that do not significantly diminish resource values.
- Class M (Moderate Use): About 1.5 million acres are Class M. These lands are managed in a controlled balance between higher-intensity use and protection. A wide variety of uses such as mining, livestock grazing, recreation, energy, and utility development are allowed. Any damage that permitted uses cause must be mitigated.
- Class I (Intensive Use): About 500,000 acres are in Class I. These lands are managed for concentrated use to meet human needs. Reasonable protection is provided for sensitive natural values, and mitigation of impacts and rehabilitation of impacted areas will occur when possible.

The CDCA also includes a designation for Areas of Critical Environmental Concern (ACEC) to protect sensitive cultural and natural resources. The ISDRA includes three ACECs. Plank Road, located in the southern portion of the ISDRA, is a historic cultural resource protected by an ACEC. East Mesa near Gordon's Well was designated an ACEC to protect habitat for the flat-tailed horned lizard (*Phrynosoma mcallii*), which is proposed for listing under the federal ESA as a "threatened" species. The Gold Basin-Rand Intaglios, located on the eastern edge of the ISDRA Plan Area, has unique prehistoric cultural resources values protected by an ACEC.

Since 1980, the CDCA Plan has been amended periodically to reflect changing conditions, including the acquisition of new knowledge relating to natural resources, and to update management strategies. Among these amendments is the 1987 ISDRA RAMP.

### 1.3.3 California Desert Protection Act

The California Desert Protection Act of 1994 (P.L. 103-433) created new wilderness areas on federal lands in the CDCA, changed the status of several former monuments and preserves to national parks, and created several special designations for wildlife sanctuaries and areas of critical environmental concern. The enactment of the CDPA formally established 32,240 acres in ISDRA as the North Algodones Dunes Wilderness area.

Prior to passage of the CDPA, BLM studied both the North Algodones and South Algodones WSAs of the ISDRA for possible wilderness designation under section 603 of the Federal Land Policy and Management Act. On January 3, 1989, Senator Alan Cranston proposed these WSAs, along with



69 other areas of the CDCA, to be designated as wilderness in Senate Bill 11 (S-11). The bill did not pass and was reintroduced by Senator Feinstein in 1993 as Senate Bill 21. Senator Feinstein, in a February 23, 1994, correspondence to her Senate colleagues asking for their support of the Bill, stated that she wanted to "... drop the entire 61,630 acre South Algodones Dunes from the bill to allow vehicle use." On October 31, 1994, the CDPA was signed into law. The Act designated as wilderness the 32,240 acre North Algodones Dunes to be managed by BLM as a part of the National Wilderness Preservation System. No wilderness was designated for the South Algodones in the Act. Congress also indicated in the CDPA that the South Algodones Dunes WSA had been adequately studied for wilderness designation pursuant to Section 603 of FLPMA, and would be released from WSA status. Since conditions relating to the wilderness values of the South Algodones Dunes have not changed since the 1994 Act, BLM will not review the area under Section 201 or 202 of FLPMA.

### **1.3.4 1987 Recreation Area Management Plan and Environmental Assessment**

The ISDRA was designated first by a management plan adopted in 1972. A Recreation Area Management Plan was adopted in 1987 and included management prescriptions for the following:

- Recreation opportunities
- Safety/emergency services/visitor protection
- Resource protection
- Protection of wilderness suitability
- Public contact and interpretation
- Facility development
- Operations and maintenance
- Concessions and vendors
- Access easements and land acquisitions
- Compatibility of land uses

Because of budgetary considerations and environmental factors, portions of the 1987 RAMP have not been implemented. The 1987 Environmental Assessment (EA) for this management plan analyzed potential environmental consequences resulting from implementation of the plan, and three other alternative management programs for the ISDRA. The 1987 Recreation Area Management Plan is outdated and will be fully replaced by the new RAMP.

### **1.3.5 Interim Closures/ Temporary Camping Closure**

Although BLM has received biological opinions from the USFWS on selected activities, further consultation is required on the overall CDCA Plan to address the cumulative impacts of all the activities authorized by the CDCA Plan. In the absence of consultation on the entire CDCA Plan, the impacts of individual activities, when added together with the impacts of other activities in the California Desert, are not known. The BLM entered into negotiations with plaintiffs (Center for Biological Diversity, and others) for establishing interim actions to be taken to provide protection for endangered and threatened species pending completion of USFWS consultation on the CDCA Plan in total. Agreement on these interim actions avoided litigation of the



plaintiffs' request for injunctive relief and the threat of an injunction prohibiting all activities authorized under the Plan. These interim agreements have allowed BLM to continue to authorize appropriate levels of activities throughout the ISDRA Plan Area during the lengthy consultation process to provide appropriate protection to listed species in the short term.

By taking interim actions, as allowed under Part 43 of the Code of Federal Regulations (43 CFR Subpart 8364), the BLM contributes to the conservation of endangered and threatened species in accordance with Section 7(a)(1) of the federal ESA. The BLM also avoids making any irreversible or irretrievable commitment of resources that would foreclose any reasonable and prudent alternative measures that might be required as a result of the consultation on the CDCA Plan in accordance with Section 7(d) of the ESA.

On November 3, 2000, a legal stipulation respecting the Peirson's milk-vetch (*Astragalus magdalenae* var. *peirsonii*), designated as threatened under the ESA became effective and five parcels in the ISDRA were closed to motorized vehicle use. The closure boundaries are identified by sign posts and identified in the Amended Stipulation and Order Concerning Injunctive Relief for the Peirson's Milk-Vetch, Case No. C-00-0927 WHA-JCS. Four closure areas were named, while the fifth parcel was unnumbered, but was described as the Patton Valley Area. These areas are delineated in Figure 1-3, and total approximately 49,000 acres.

On October 18, 2001, the legal stipulation respecting the desert tortoise (*Gopherus agassizii*), also designated as threatened under the ESA, became effective; and a temporary camping closure on approximately 25,600 acres of desert tortoise habitat within the ISDRA was approved. The camping closure is located east of Glamis and the UPRR (see Figure 1-3). As with other ISDRA management directions, the camping restriction does not apply to private lands within the closure area, nor does it restrict the use of motorized vehicles on existing routes of travel otherwise allowed by the CDCA Plan and 1987 RAMP.

### **1.3.6 Northern and Eastern Colorado Desert Coordinated Management Plan**

The Northern and Eastern Colorado (NECO) Desert Coordinated Management Plan area is adjacent to the ISDRA but does not overlap the ISDRA, except in the eastern side of the Buffer Zone Management Area. The NECO Plan addresses several issues including: (1) recovery of the desert tortoise, (2) conservation of the variety of other species and habitats, and (3) public lands access and uses. The NECO Plan provides a wide range of actions that relate primarily to land use allocations and on-the-ground actions. The BLM will coordinate management decisions so that the management of the ISDRA areas that are adjacent or adjoining the NECO areas is consistent, whenever practical.



### 1.3.7 Other Plans and Programs

The following plans and programs are directly or indirectly applicable to the planning process at ISDRA. An updated recreation area management plan will take these plans and programs into account, and incorporate appropriate elements:

- Wilderness Implementation Strategy (WIS), August 31, 1999. This strategy will continue to be used to manage the North Algodones Wilderness Area of the ISDRA.
- National Management Strategy for Motorized Off-Highway Vehicle Use on Public Lands (January 2001).
- State Implementation Plan For PM<sub>10</sub> in the Imperial Valley, Executive Summary, Final (1993). The ISDRA falls within the Salton Sea Air Basin, which is classified as a nonattainment area for particulate matter with a diameter less than 10 micrometers (PM<sub>10</sub>) based on federal Clean Air Act standards. Planning efforts at ISDRA will be consistent with the State of California Air Quality Implementation Plan.
- County of Imperial General Plan (1996): This plan seeks to direct growth, particularly urban development, to suitable areas in Imperial County.
- California Desert District Business Plan Recreation Fee Demonstration Project. This plan will be utilized in the development of fees.
- Algodones Dunes Habitat Management Plan (1987). An updated Recreation Area Management Plan will amend this document and will take precedence in management decisions.
- Wildlife Habitat Protection Program. An updated Recreation Area Management Plan will supplement this plan.
- Imperial County Emergency Medical Services ALS/BLS Treatment Protocols, as Amended. The BLM provides basic life support in the ISDRA following this plan.
- Interpretive Plan for the El Centro Resource Area (1991). This document provides a framework for interpretative services and development on public lands in the El Centro Resource Area. The ISDRA interpretative services will be developed in accordance with this plan.
- Law Enforcement Special Evaluation, Law Enforcement in the California Desert (2000)
- El Centro Law Enforcement Plan. This plan establishes general guidelines for law enforcement for the El Centro Field Office.
- Mineral Resources of the North Algodones Dunes Wilderness Study Area (1984).



- Plank Road Areas of Critical Environmental Concern Management Plan (1985).
- Desert Tortoise Recovery Plan, U. S. Fish and Wildlife Service. The ISDRA is within the range of the desert tortoise but is not within critical habitat or any existing or proposed reserve area.
- Flat-Tailed Horned Lizard Range-wide Management Strategy (1997).
- Volunteer Opportunities with the Bureau of Land Management in the El Centro Resource Area.

### 1.3.8 Endangered Species Act

The ESA provides for the federal protection of threatened plants, insects, fish, and wildlife. The USFWS administers the ESA on behalf of the United States. The major components of the ESA include:

- Provisions for the listing of threatened and endangered species
- The requirement for consultation with USFWS on federal projects
- Prohibitions against the taking of listed species
- Provisions for permits to allow incidental taking of threatened and endangered species

As noted previously, a revised RAMP will be reviewed by USFWS in accordance with Section 7 of the ESA. Under Section 7, the BLM is required to consult with the USFWS to ensure that any actions authorized, funded, or carried out are not likely to "jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modifications of lands determined by USFWS to be 'critical habitat'."

Consultation with USFWS is discussed above under Section 1.4.3.

## 1.4 CONSULTATION AND COORDINATION

### 1.4.1 Public Scoping Meetings

The scoping process for the project was designed to solicit input from stakeholders, the public, and other interested parties on the issues related to the development of a revised RAMP. The BLM initiated the public involvement in 1998. Subsequent public involvement activities most recently were conducted in September 2001.

The BLM conducted three public planning meetings and seven public scoping meetings between June 1998 and February 2000 to solicit input from the public. Three subsequent scoping meetings were conducted during September 2001. The meetings were held at the following locations and dates. The number of attendees at each meeting is noted in parentheses (where available):



## Introduction

### Initial Public Planning Meetings

- 1) San Diego, California  
June 16, 1998
- 2) Phoenix, Arizona  
June 22, 1998
- 3) Anaheim, California  
June 30, 1998

### Initial Public Scoping Meetings

- 1) Yuma, Arizona  
January 10, 2000
- 2) Long Beach, California  
January 12, 2000
- 3) Cahuilla, California  
January 14, 2000
- 4) Phoenix, Arizona  
January 25, 2000

### Subsequent Public Scoping Meetings

- 1) El Centro, California  
(50 attendees)  
September 6, 2001
- 2) Phoenix, Arizona  
(300 attendees)  
September 25, 2001
- 3) San Diego, California  
(400 attendees)  
September 27, 2001

The initial Notice of Intent (NOI) to Prepare an EIS pursuant to NEPA was published in the *Federal Register* on October 10, 2001. A subsequent NEPA NOI was published for the additional scoping meetings conducted in September 2001. Additional notification of the action was provided by publishing public notices in newspapers of general circulation. The public scoping meetings were advertised in seven local newspapers: Imperial Valley Press, Desert Sun, San Diego Union Tribune, Los Angeles Times, El Sol del Valle, Arizona Republic and The Yuma Daily Sun. Other tools used to communicate with interested parties include "The Dunes Newsletter" and postcard announcements of meeting dates and the NOI publication. A copy of the Notice of Availability (NOA) for this DEIS is in Appendix A.

### **1.4.2 Issues, Concerns, and Oppor- tunities**

An initial step in developing the revising a management plan involves identifying relevant issues, concerns, and opportunities using input obtained from public scoping meetings to determine management program goals, in this case for the ISDRA. The 1987 RAMP was used as a reference point to begin identifying these concerns, and the BLM used these concerns in conjunction with desired future conditions (discussed below in Section 1.4.3), to develop the management measures that form the basis for the alternatives assessed in this DEIS (See Chapter 2). The issues raised by the public include questions on the level of recreational use, OHV recreation management, loss of available OHV recreation areas in the CDCA Plan area, air quality, facility development, and other topics.

The following 16 issues, concerns, and opportunities are captured as a series of questions and responses, and will be carried forward by the BLM in the development of a revised management plan for the ISDRA:

1. What level or levels of recreation setting will be provided at the ISDRA?



The ISDRA can provide a wide variety of outdoor settings. Currently, the majority of the area is an undeveloped setting where recreational enthusiasts can engage in activities that are not dependent on facilities and experience a moderate level of self-reliance and risk. Natural resources in these areas have not been modified to accommodate human use. About 25 percent of the ISDRA is in a more developed setting where many of the activities are based at or near facilities. Natural resources in these areas have been significantly modified to accommodate human use. There are currently no guidelines to direct the development, or lack of development, of any of the areas associated with the ISDRA. Public opinion varies as to what range of settings should be accommodated at the ISDRA.

2. How will OHV recreation be managed in relation to resources and other recreational activities, including safety?

Federal regulations (43 CFR 8340.0-2) requires that BLM protect the resources of the public lands, promote the safety of all users of those lands, and minimize conflicts among the various users of those lands. Both advocates and opponents of OHV use are concerned about how to manage this activity to minimize impacts on other resources and to be compatible with other recreational activities. The concern focuses around the issues of public health and safety resulting from crowding in some OHV areas, saving camp spots, and dumping of gray water and litter. There are also concerns with quiet times, camp area speed limits, and the general unruliness of some dunes enthusiasts. Finally, there is a more general concern about the potential adverse effects of OHVs on plants, wildlife, geologic resources and other elements of the ISDRA environment.

3. How much facility development and access is appropriate for the ISDRA?

This issue addresses the suitability of the area to accommodate additional camp pads, contact stations, roads, etc. A revised RAMP will provide a description of the facility development anticipated in the next 10 years.

4. How often, where, and what should vendors/concessionaires be allowed to operate on public land in the ISDRA to best serve the needs of the public?

This issue addresses the vendor program in the ISDRA. A revised RAMP will limit vendors and concessionaires in the ISDRA to those that provide food, goods, or services that support OHV use and camping.

5. How much impact are the tour buses having on the facilities at the ISDRA and should there be compensation for that use?

There has been a notable increase in visitation to ISDRA by commercial tour buses since the 1987 RAMP was completed. Since the reconstruction of the Osborne Overlook access road and the installation of the pit toilets at the Buttercup Campground, several commercial tour bus companies regularly



stop and utilize the facilities. Identification of these companies is difficult due to staffing levels and uncontrolled access to the ISDRA. For both areas, the BLM manages and maintains roads with commercial vehicle weight limits. It is undetermined if the tour bus traffic significantly increases the level of maintenance and repairs required for the roads and restrooms. It is also undetermined if there are any recreational or resource conflicts.

Federal regulations, (43 CFR 2930 and 8370) address issuance of permits for recreation on public lands. These regulations allow the BLM to issue permits to manage recreational use, reduce recreational and resource conflicts, and to receive a return for commercial uses of public lands.

6. How will the BLM conserve the unique natural resources of the ISDRA in an area managed for OHV use?

The Endangered Species Act of 1973 (ESA) and the California Endangered Species Act (CESA) provide for protection of federal or state listed species on public lands in California. The BLM consults with the U.S. Fish and Wildlife Service and the California Department of Fish and Game (CDFG) on actions that may affect listed species, such as a revised RAMP. The listed and sensitive species identified in the area are described below.

The Algodones Dunes are home to five special-status plant species: the Peirson's milk-vetch, which is listed as threatened under the ESA and endangered under CESA; the Algodones Dunes sunflower, which is listed as endangered under CESA; Wiggins croton, which is listed as rare by the State of California; and sandfood and giant Spanish needle, which are considered rare and endangered, respectively, by the California Native Plant Society (CNPS).

One federally proposed lizard species, the flat-tailed horned lizard occurs in relatively low densities at the ISDRA. The Colorado Desert fringe-toed lizard, a former federal candidate species and BLM-sensitive species, is abundant at the ISDRA, especially in active dunes and psammophytic scrub. Additionally, the federally and state listed threatened desert tortoise probably occurs in the microphyll woodlands on the east side of the ISDRA, as does the Gila woodpecker, a state listed endangered species. Additionally, the BLM sensitive Couch's spadefoot toad probably occurs in the microphyll woodlands on the east side of the ISDRA. The toad is also a state species of concern.

The creosote bush scrub and microphyll woodland habitats adjacent to the ISDRA probably contain the BLM sensitive species, the burrowing owl, which is also a state species of concern. The loggerhead shrike, LeConte's Thrasher and Yuma mountain lion, all species of concern, also occur at the ISDRA. Additionally, three poorly known beetle species, all BLM-sensitive species, occur at the ISDRA: Andrew's dune scarab beetle, Hardy's dune beetle, and Carlson's dune beetle.



A revised RAMP will provide for conservation of these species through the North Algodones Dunes Wilderness Management Area that covers 21 percent of the ISDRA, and the Adaptive Management Area covering 23 percent of the ISDRA. These areas will conserve species by reducing vehicle mortality and habitat degradation within their boundaries. They also incorporate large areas of microphyll woodland, active dunes, psammophytic scrub, and creosote bush scrub within their boundaries, to ensure that each plant community and its associated wildlife have adequate conservation.

7. What level of information and resource interpretation should be provided at the ISDRA?

This issue addresses the type of interpretive materials (signs, brochures, etc.) that should be available to the public to better inform them about the critical resources and regulations of the ISDRA.

8. How will education, law enforcement, and other techniques be used to ensure compliance with laws and regulations at the ISDRA?

Federal regulations Title 43CFR Part 8340.0-2 directs BLM to protect the resources of the public lands, to promote the safety of all users of those lands, and to minimize conflicts among the various users of those lands.

An ever-increasing visitor population during the high use season has created larger crowds in the camping and riding areas. Along with this, there seems to be an increase in irresponsible visitors who act without regard to the consequences to themselves or others. The need to develop an educational program to raise the level of awareness of the rules, regulations, and safety concerns was identified by the public. The need to develop better ways of disseminating information to visitors through the use of the Internet and partnerships with the various user groups and businesses that focus on the ISDRA was also identified.

The increase in violence and serious injuries already negatively affects the average ISDRA user. The goal is to increase the amount of law enforcement on an as-needed basis. BLM will work with local and regional law enforcement agencies to develop a permanent and flexible solution. Yearly monitoring of all violations and resource impacts resulting from noncompliance will assess the effectiveness of the enforcement. This monitoring will serve as a basis for adjusting the amount of law enforcement officers needed and the tactics that are used. The focus of the enforcement would be directed at the more serious problems and the goal is to increase the quality of use enjoyed at the ISDRA.

BLM will identify other options available to aid in the implementation of the education and enforcement process such as visitor involvement, alternative forms of punishment for certain violations, crowd-size limitations, area curfews, and limiting alcohol use will be considered. The various user groups will assist in providing peer volunteers and provide safety rule and regulation



information programs. Some options to encourage compliance include court-ordered community service and litter cleanups in lieu of fines. This type of program may serve as an alternate form of education and punishment. Crowd-size limitations and area curfews may help to reduce the amount of people in the ISDRA and disturbances after hours. The use of alcohol limitation may improve behavior and reduce litter concerns.

9. What is considered to be the Visitor Supply at the ISDRA? Is it being exceeded and, if so, what actions should be taken?

This issue addresses the number of visitors that are coming to the ISDRA. The visitor supply will be determined by use of the Recreation Opportunity Spectrum (ROS). The ROS is a system that provides guidelines to manage recreational opportunities, available facilities, and visitor supply. This tool will allow BLM to manage the ISDRA based on the type of recreation experience that is desired for a specific area. BLM will manage the ISDRA so that the ROS classification is met 50 percent of the time. If visitation exceeds the supply, management actions can be taken.

10. How much motorized trespass is occurring in the North Algodones Dunes Wilderness Area, what impacts are occurring, and how can it be eliminated?

Motorized trespass continues inside the wilderness area, but it is not known at what levels. This issue will look at what areas are being used to illegally enter the wilderness area and at what levels it is occurring. Several options to stop illegal motorized trespass will be evaluated.

11. What management actions should be utilized for legal motorized access afforded the Border Patrol, California Department of Fish and Game, and other law enforcement agencies to the North Algodones Dunes Wilderness?

The enabling legislation that designated the North Algodones Dunes Wilderness Area was the CDPA. This Act allows for continued motorized use by the CDFG to monitor and maintain their wildlife guzzlers inside the wilderness area. The CDPA also allows U.S. Border Patrol to continue their operations inside the wilderness area. Although these uses are allowed, they have an impact on the wilderness values of solitude and naturalness. This Draft RAMP will discuss at what levels these uses will be allowed and how the impacts can be mitigated, while accomplishing the goals of all agencies involved.

12. What is the future for the Fee Demo program?

The Fee Demo Program began in the ISDRA on January 1, 1999, as authorized by Congress through the BLM's appropriation process. There has been controversy over the program since its inception. Responding to public criticism, the BLM entered into a Memorandum of Understanding (MOU) with the California Department of Parks and Recreation Off-Highway Motor



Vehicle Recreation Division, and the California Off-Highway Motor Vehicle Recreation Commission. This MOU expired on September 30, 2000. In support of this MOU, a technical review team (TRT) was created to provide input about how the collected funds should be spent in the ISDRA. It is expected that the TRT will be reorganized to allow additional public input in the fee demo program.

The 2002 fiscal year Department of the Interior (DOI) appropriations bill extends the Fee Demo test program through September 2002. This is the fourth extension of the original expiration date. It is unknown at this time how many more times it will be extended or if it will become permanent legislation. Currently, the future of the Fee Demo Program across the U.S., including the ISDRA, depends upon the continued reauthorization of this legislation by Congress.

13. How will priorities be set with potential budget reductions from “green sticker” and allocated dollars?

In past years, partnerships with the State of California Off-Highway Vehicle Commission and Division have provided a substantial amount of financial support to the ISDRA. Current regulations are making those dollars increasingly more difficult to obtain, causing concern for future programs at the ISDRA. Creative financing solutions will be developed for those programs and/or development projects that warrant continuation. Actions to determine which programs and projects are carried forward will also be developed.

14. How will potential/partial closure of the ISDRA to recreational use affect OHV users, vendors and the communities who base their livelihood and income on OHV activities?

The economic effects of the recreational use of the ISDRA were considered in the development of the alternatives in the DEIS. One of the reasons that the Adaptive Management Area was developed was to allow as much recreational use as possible without having a negative effect on the biological and cultural resources in the ISDRA.

15. At what level are noxious weeds occurring within the ISDRA Plan Area? What measures can be taken to reduce or eliminate them?

The area has known scattered infestations of saltcedar (*Tamarix ramosissima*), leafless tamarisk (*Tamarix aphylla*), Sahara mustard (*Brassica tournefortii*), cheat grass (*Bromus tectorum*), and extensive areas of schismus (*Schismus barbatus*). Infestations of saltcedar occur in the pockets of the eastern dunes where water collects following rainstorms. Large leafless tamarisks are present north of SR-78 near Glamis. The east side of the wilderness area contains very heavy infestations of Sahara mustard in microphyll woodland, desert dry wash woodland, and creosote bush scrub habitats. The mustard has



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also been sighted near the Buttercup off-ramp between the freeway and the frontage road.

Weeds can be eliminated with herbicide applications on a limited scale. Larger-scale removal is not possible due to the large size of the ISDRA and funding limitations. In the future exotic plant removals will focus on areas with severe infestations that are of high biological value. Eradication of exotics over the majority of the ISDRA is not a feasible goal. In the future, biological controls may become available for some of these species that would allow wide-scale control. However, at this time, these methods are not available.

### 16. How can air quality standards in the ISDRA be met?

The Glamis area has intermittently poor air quality resulting from smog and agricultural burning in the nearby Imperial and Mexicali Valleys. The ISDRA Plan Area is located within Imperial County, which is entirely a nonattainment area for ozone, and partially a nonattainment area for PM<sub>10</sub>. This situation is exacerbated on holiday weekends in the fall and winter. At these times, large numbers of OHV and motor homes arrive in the Glamis area, creating extensive quantities (large clouds) of airborne dust particles and hydrocarbon emissions. Air quality stations will be installed at regular intervals both inside and outside the ISDRA to gather quantifiable data on the impact of OHVs on air quality. After the effects can be determined, appropriate corrective actions, if any, can be developed.

### 17. Can the loss of OHV opportunities throughout the CDCA Plan Area be mitigated?

Since the inception of the CDCA Plan in 1980, the demand for areas open to OHV recreational use has increased. At the same time, other management objectives on BLM-managed lands have constrained access to some of the areas used historically for OHV recreation. (For example, OHV use areas have been closed to protect sensitive biological resources.) In revising the 1987 RAMP, the action assessed in this DEIS pertains specifically to BLM-managed lands at the ISDRA. In this context, the BLM will revise the 1987 RAMP to address this concern by analyzing the opportunity to provide camping in alternate areas if camping is closed in more sensitive areas. In addition, a revised RAMP for the ISDRA will not result in the closure of other dunes areas in the desert Southwest.



### 1.4.3 Desired Future Conditions/ Management Goals and Objectives

In addition to the identification of issues identified by the public, the BLM's planning process included a RAMP Working Group, comprising representatives from the environmental and OHV communities, the BLM, and Imperial County staff. This Working Group developed a list of desired future conditions to assist planners in identifying goals and objectives for the ISDRA during the next 10 to 15 years. The desired future conditions also provide the basis for comparing the relative merits of each action alternative (see Chapter 2 of this DEIS). The following summarizes the goals and management objectives that guide the BLM in the development of the alternatives and the identification of Alternative 2, which is presented in See Section 2.1.2.2:

- Goal 1 - Provide a variety of sustainable OHV and other recreational activities
- Goal 2 - Maintain or improve conditions of the special-status species and other unique natural and cultural resources
- Goal 3 - Create an environment to promote the health and safety of visitors, employees, and nearby residents by working with local, state, and federal agencies and interest groups

Certain goals and objectives in managing the ISDRA are provided through FLPMA and the CDCA Plan. Since its designation, the ISDRA has been managed according to mandates set forth in both the 1980 CDCA and 1976 FLPMA. Among FLPMA's requirements is the following:

“the use of all California desert resources can and should be provided for in a multiple use and sustained yield management plan to conserve these resources for future generations, and to provide present and future use and enjoyment, particularly outdoor recreation uses, including the use, where appropriate, of off-road recreational vehicles...” [Title VI. SC1781. Sec. 601 (a)(4)].

Management objectives for MUCs have been formulated in the CDCA Plan to stipulate whether and how intensely different areas may be used for recreational purposes (refer to Section 1.3.2). Because these MUCs are legally binding, unless amended through the public process, the BLM must manage the ISDRA according to MUC prescriptions.

### 1.4.3 Agency Consultation

Prior to implementation of an updated management plan, formal consultation with the USFWS will occur to determine impacts to species listed as threatened or endangered under the federal ESA. Species that are known to occur, or have the potential to occur at the ISDRA, which are listed as threatened under the federal ESA, are the Peirson's milk-vetch, flat-tailed horned lizard, and desert tortoise.

Pursuant to Section 7 of the ESA, the USFWS will provide a Biological Opinion of the Preferred Alternative, based on an analysis of that alternative documented in a Biological Assessment (Appendix B). (The Preferred Alternative is discussed in the introduction to Chapter 2 of this DEIS). On the



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basis of a review of the Biological Assessment, the USFWS will issue a Biological Opinion of the Preferred Alternative. If the USFWS determines that the impact of the Preferred Alternative would not threaten the continued survival of a listed species, they may grant approval of the project through issuance of a "No Jeopardy" opinion. Alternatively, if implementation of the Preferred Alternative is found to undermine the continued survival of one or more listed species, the action cannot move forward without additional mitigation and/or changes to the proposed parameters.

### 1.5 AUTHORIZING ACTIONS

Prior to implementation of the Preferred Alternative, a Record of Decision (ROD) must be issued in accordance with NEPA. A ROD provides a written record explaining why the lead agency (BLM) has taken a particular course of action. Issuance of the ROD would allow the BLM to move forward in amending the CDCA Plan with an updated recreation area management plan. The amendment of the CDCA Plan would then allow for implementation of the management actions described in the recreation area management plan.

Other federal agencies with jurisdiction at the ISDRA could also be required to approve the Preferred Alternative. As noted above in Section 1.3.8, approval is subject to Section 7 of the ESA. Therefore, implementation of a revised recreation management plan is contingent upon the issuance of a "No Jeopardy" opinion from USFWS. None of the action alternatives is anticipated to affect any waters of the United States under the jurisdiction of the United State Army Corps of Engineers (USACE) and, therefore, would not be subject to Section 404 or 401 of the Clean Water Act.

Because no discretionary actions are currently required at the state or local level, implementing the Preferred Alternative would not require review under the California Environmental Quality Act (CEQA). Future management actions associated with implementation of a revised RAMP, however, could require approval from state and/or local agencies. If it is determined that these actions are subject to CEQA, appropriate environmental documentation would be prepared in accordance with the CEQA Guidelines.

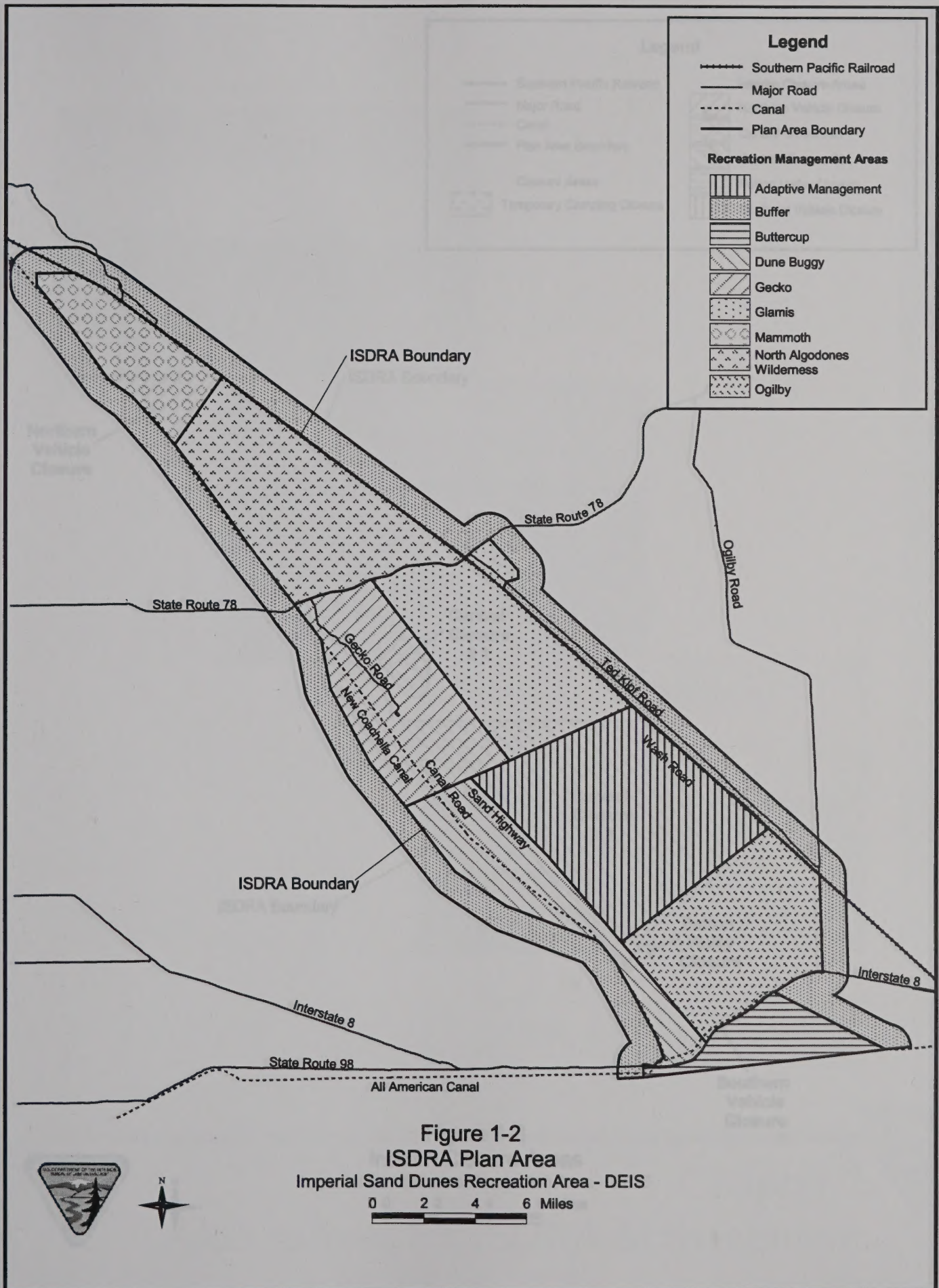








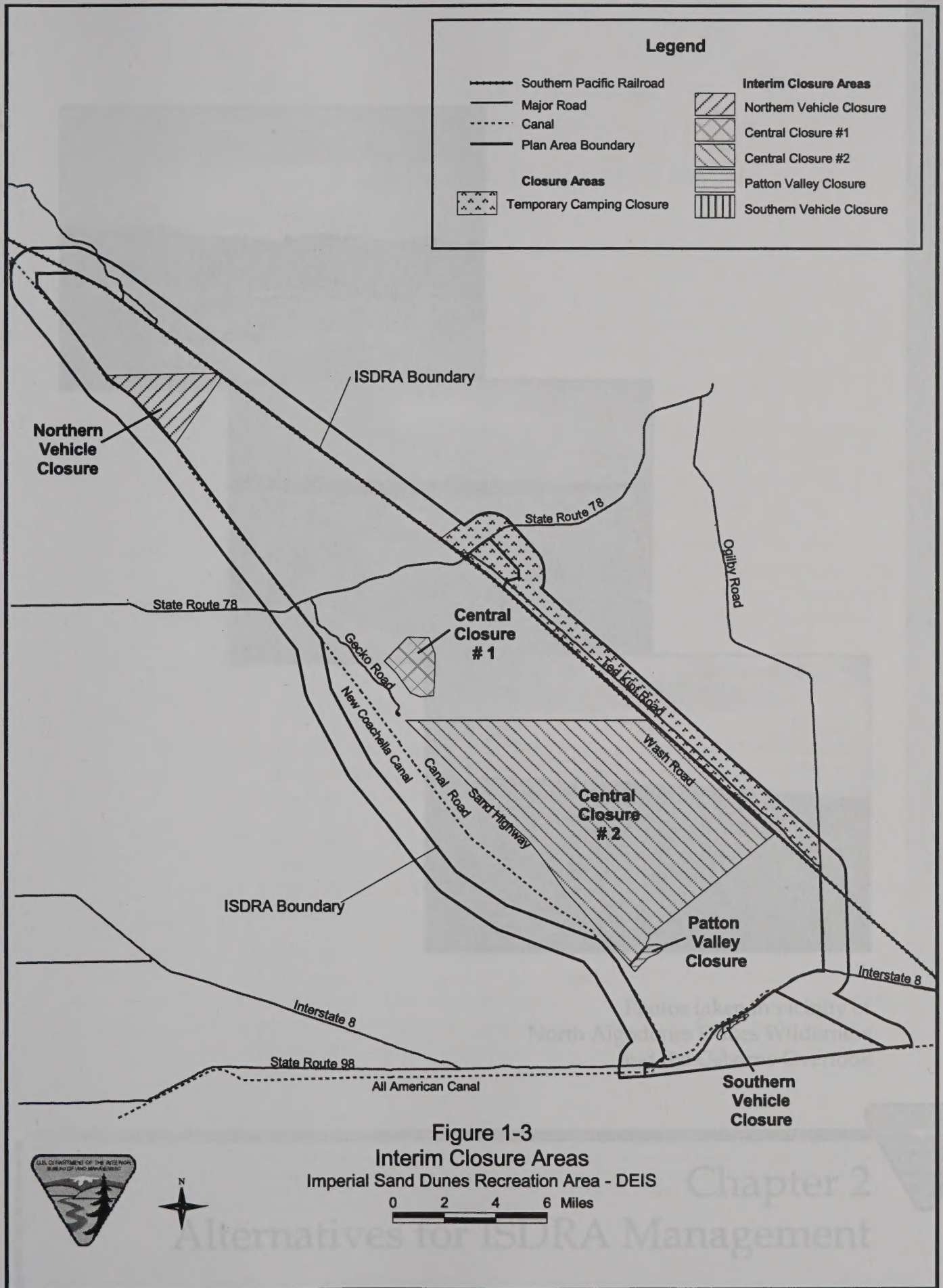




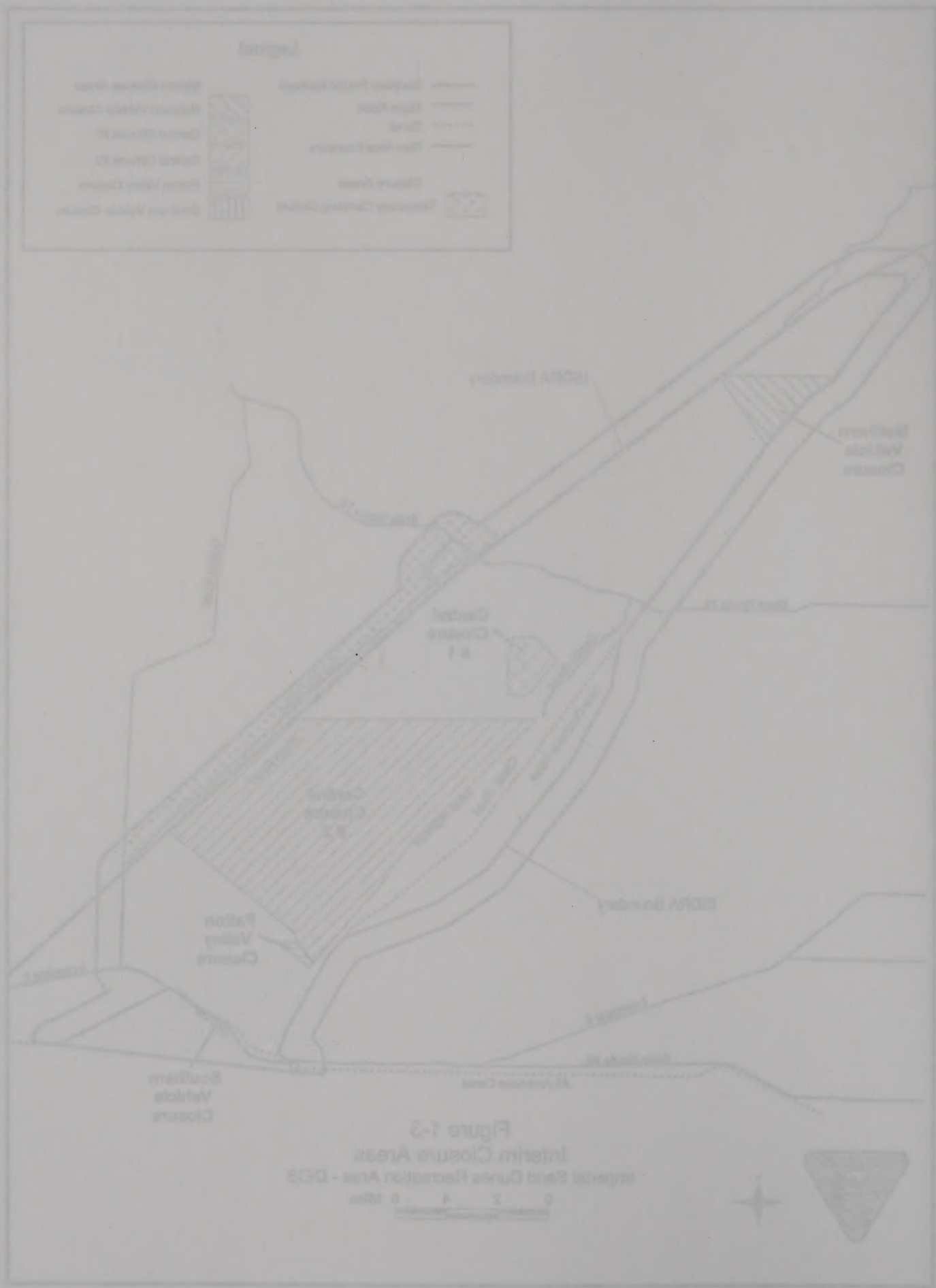














## CHAPTER 2.0

# ALTERNATIVES FOR ISDRA MANAGEMENT



- Analyze each alternative to determine the impacts of the proposed action and the impacts of the proposed action on the environment.
- Identify the Environmental Alternatives that are consistent with the proposed action and the impacts of the proposed action on the environment.
- Include a No Action Alternative to determine the impacts of the proposed action on the environment.

The alternatives were developed in response to the request for proposals, to, substantive public input on the existing environment and uses, and desired future uses and environmental conditions. The alternatives were developed in response to the request for proposals, to, substantive public input on the existing environment and uses, and desired future uses and environmental conditions.

Photos taken in vicinity of  
North Algodones Dunes Wilderness  
and the Osborne Overlook



## Chapter 2 Alternatives for ISDRA Management



Photos taken in vicinity of  
North Algonquin Park Wilderness  
and the Ontario Overlook

## Alternatives for ISDRA Management Chapter 2





## CHAPTER 2.0

# ALTERNATIVES FOR ISDRA MANAGEMENT

This chapter presents the NEPA alternatives (including the No Action, the action alternatives, the alternatives considered but not carried forward, and Alternative 2) analyzed in this DEIS. The alternatives were developed in response to the Issues, Constraints, and Opportunities identified through the public scoping process that was discussed in the previous chapter.

NEPA requirements (40 CFR 1502.14) direct federal agencies to:

- Consider a range of alternatives that could accomplish the lead agency objectives (i.e., Purpose and Need) and present the alternatives in comparative form to define the issues and provide a clear basis for decisionmakers and the public to choose among options.
- Explore rigorously and evaluate objectively a reasonable range of alternatives. If alternatives have been eliminated from detailed study, the EIS must briefly discuss the reasons they were eliminated. The range of alternatives is project-specific, depending on the nature of the proposal and the facts and circumstances of the project.
- Analyze each alternative to a degree that is substantially similar to the analysis afforded the proposed project.
- Identify the Environmentally Preferable Alternative from the range of alternatives considered. This alternative is typically the scenario that best promotes the environmental policy expressed in NEPA.<sup>1</sup>
- Include a No Action Alternative. NEPA requires that a No Action Alternative be developed and evaluated to allow decisionmakers to compare the impact of approving the Proposed Action with the impacts of not approving the Proposed Action.

The alternatives were developed by the BLM on the basis of, and in response to, substantive public input on the existing environment and uses, and desired future uses and environmental conditions, of the ISDRA. On the basis of this input and in consideration of their management obligations under FLPMA and other statutory and policy guidance (see Section 1.3), the BLM developed a series of desired future conditions/management objectives that are intended to

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<sup>1</sup> The purposes of NEPA are: To declare a national policy that will encourage productive and enjoyable harmony between man and his environment; to promote efforts that will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality. **Sec. 2 [42 USC § 4321]**



## Alternatives for ISDRA Management

apply to a revised RAMP. These conditions/objectives also apply to all the alternatives considered in this DEIS. The goals established by the BLM (see Section 1.1, Purpose and Need) are consistent with the overall management direction provided to the BLM by the various statutes, policies, and guidelines discussed in Section 1.3 of this DEIS. The alternatives considered in this DEIS and subjected to analysis are:

- Alternative 1: No Action
- Alternative 2: Recreation and Natural/Cultural Resource Protection Alternative
- Alternative 3: Natural and Cultural Resource Protection Alternative
- Alternative 4: Motorized Recreation Opportunities Alternative

The alternatives analyzed in this DEIS, including the No Action Alternative, are presented in Section 2.1 and the alternatives considered but eliminated from further analysis are presented in Section 2.2. The BLM's Preferred Alternative is Alternative 2.

All the alternatives (with the exception of Alternative 1, No Action) include geographically delineated management areas (see Section 2.1.2, below) and proposed ROS classifications. The ROS is a system used by many federal and state land management agencies to categorize outdoor recreation settings. There are six recreation settings within the ROS system, and each setting provides a different set of recreation opportunities and experiences. ROS settings range from highly modified environments with numerous contacts with other people to undisturbed natural environments with little or no contact with others. The ROS classifications and their characteristics are:

- Primitive
  - Essentially unmodified natural environment of a fairly large size
  - Low visitor use
  - Facilities only for resource protection (no user comfort/convenience facilities)
  - No motorized use
- Semi-Primitive Non-Motorized
  - Predominantly unmodified natural environment of moderate-to-large size
  - Low visitor use, but often other area users are evident
  - Facilities provided for the protection of resource values and the safety of users
  - Motorized use not generally allowed



- Semi-Primitive Motorized
  - Same as Semi-Primitive Non-Motorized except that motorized use is allowed
- Roaded Natural
  - Resource modification and utilization practices are evident, but harmonize with the natural environment
  - Low-to-moderate visitor use (moderate evidence of the sights and sounds of humans)
  - Onsite controls and restrictions offer a sense of security
  - Rustic facilities are provided for user convenience as well as for safety and resource protection
  - Facilities are sometimes provided for group activity
  - Conventional motorized use provided for in construction standards and design of facilities
- Rural
  - Substantially modified natural environment
  - Moderate-to-high visitor use concentration
  - A considerable number of facilities designed for use by large numbers of people; facilities often provided for specific activities
  - Developed sites, roads, and trails designed for moderate to high use
  - Moderate densities provided far away from developed sites
  - Facilities for intensive motorized use available
- Urban
  - Substantially urbanized environment (background may have natural-appearing elements)
  - Renewable resource modification and utilization practices often used to enhance specific recreation activities
  - Vegetative cover often exotic and manicured, and sights and sounds from humans predominant onsite
  - Large numbers of users expected both onsite and in nearby areas
  - Facilities for highly intensified motor use and parking available with forms of mass transit often available to carry people throughout the site



## 2.1 ALTERNATIVES ANALYZED IN THIS DEIS

Under Alternative 1 (No Action), neither the designation of management areas nor the assignment of ROS classes would occur (see Section 2.1.1).

Under the action alternatives assessed in this DEIS (Alternatives 2, 3, and 4), the management areas would be applied and would be common to all the action alternatives (Section 2.1.2). The ROS classifications are the key features that would vary among the action alternatives to provide variations in the proposed level and management focus of visitor use.

Eight management areas in the ISDRA and the Buffer Zone (see Section 2.1.2.1) comprise the Plan Area evaluated in this DEIS.

### 2.1.1 Alternative 1: No Action Alternative

Under Alternative 1, the ISDRA would continue to be managed according to the existing and approved management plan and policies (e.g., the 1987 RAMP). In addition, the No Action Alternative would include compliance with policies and management measures instituted since the 1987 RAMP was first implemented, including the designation of the North Algodones Dunes Wilderness in 1994 and the release of Wilderness Study Area 362 from further suitability studies. Alternative 1 does not include the construction of the Gecko Road extension because such an action would not comply with the Endangered Species Act. Also, Alternative 1 does not include the interim OHV closure areas or the temporary camping closure (see Section 1.3.5 of this DEIS) because these are temporary measures and not part of the management policy for the ISDRA. The CDCA Plan would not be amended under this alternative, and no adaptive management program would be implemented.

Because the ISDRA would continue to be managed according to existing and approved management plans prescribed by the 1987 RAMP, this alternative would develop facilities only to the extent directed by that plan. Alternative 1 would not result in precisely the same implementation actions prescribed by the 1987 RAMP because management must also accommodate the findings of more recent resource inventories at the ISDRA, as well as updated regulations that could constrain full implementation (e.g., new facilities would not be allowed in the wilderness area). Under this alternative, the management areas that would apply to the action alternatives (see Section 2.1.2) would not be created; and no ROS classifications would be assigned to the ISDRA. Therefore, management actions would default, with the exceptions noted above, to the 1987 RAMP. Alternative 1 is shown in Figure 2-1.

### 2.1.2 Alternatives 2, 3, and 4: The Action Alternatives

This section summarizes the action alternatives (Alternatives 2, 3, and 4) assessed in this DEIS. The discussion first focuses on the proposed management actions that would be implemented under a revised RAMP that are common to all the action alternatives (Section 2.1.2.1). Next is the discussion of the actions that would be specific to each alternative (Section 2.1.2.2). In general, the activities proposed for the Plan Area are similar to current practices and represent revised (rather than new) procedures



that are responsive to changes that have occurred since the last update of the RAMP in 1987. The major differences between management under existing conditions and the three alternatives discussed below are the delineation of management areas, assignment of ROS classifications to those management areas, enhancement of efforts to encourage a safe and enjoyable recreational experience for the user, and an emphasis on public education about OHV use in the context of the recreational, cultural, and biological resources of the area. Where facilities are planned, and where law enforcement would be increased, these actions are proposed to enhance public safety in the context of an enjoyable recreational experience.

**2.1.2.1  
Management  
Areas and  
Actions for all  
Action  
Alternatives**

This section summarizes the overall management actions proposed by the BLM that would pertain to all the action alternatives (Alternatives 2, 3, and 4) analyzed in this DEIS. Under the revised RAMP, the existing management divisions of the ISDRA would be revised to create eight management areas within the ISDRA and one management area (the Buffer Zone) external to the ISDRA boundary. These management areas, which are shown in Figures 2-1 through 2-4 and listed below, would be the same under all three action alternatives. Each management area would be assigned a specific ROS classification that would guide permitted activities, and help the BLM to establish planning goals for visitor use in the different management areas. The ROS classifications vary among the alternatives (see Sections 2.1.2.2.). These management areas would be:

- Mammoth Management (MM) Area
- North Algodones (NA) Dunes Wilderness Management Area
- Gecko Management Area (GM)
- Glamis Management (GLM) Area
- Adaptive Management (AM) Area
- Ogilby Management (OM) Area
- Dune Buggy Flats Management (DM) Area
- Buttercup Management (BM) Area
- Buffer Zone Management (BZM) Area

A summary of the management actions that pertain to all the action alternatives (for all the management areas) is presented in Table 2-1.

**Table 2-1 Plan Area Management Actions  
(applicable to all Management Areas for Alternatives 2, 3, and 4)**

Recreation	Maintain and manage ISDRA as a unique locale providing rural, roaded-natural, and semi-primitive OHV recreation opportunities in the desert Southwest
Public Outreach	Develop a public relations program on cultural and natural resources; safety; interpretive displays and brochures
Biological Resources	Manage using principles of adaptive management. Adaptive management is a process of implementing policy decisions as scientifically driven management experiments that test predictions and assumptions in management plans, using the resulting information to



## Alternatives for ISDRA Management

**Table 2-1 Plan Area Management Actions**  
(applicable to all Management Areas for Alternatives 2, 3, and 4)

	improve the plans.
Air Quality	Implement dust control measures on wash roads and install air monitoring equipment for ozone and PM10
Transportation/Traffic	Grade roads and implement fee entry and construct traffic control
Public Safety	<ul style="list-style-type: none"> <li>• Create a law enforcement cooperative team</li> <li>• Increase permanent staff and holiday staff to address the increases in visitor use of major holidays</li> <li>• Ban alcohol outside camping areas</li> <li>• Establish a sundown to sunup closure at Competition Hill north and south, Oldsmobile Hill, Test Hill, and Patton Valley</li> <li>• Post speed limits</li> <li>• Develop and maintain radio system</li> <li>• Continue existing condition of dispatching duties from Cahuilla Ranger Station</li> </ul>
Visitor Use	<ul style="list-style-type: none"> <li>• Establish ROS classifications and visitor use targets for management areas</li> <li>• Limit ISDRA use of OHVs if visitation exceeds proposed ROS classifications</li> </ul>
Land Use	Establish management areas with specific ROS classifications to meet planning objectives
Commercial	<ul style="list-style-type: none"> <li>• Allow vending from October 1 through May 31 on Friday through Sunday (exceptions made for major holidays)</li> <li>• Do not allow nonrecreational commercial activities during the holidays</li> </ul>
Access and Facilities Development	<ul style="list-style-type: none"> <li>• Develop or retrofit facilities, in the appropriate ROS classes, to accommodate visitation and meet all disability regulations and standards</li> <li>• Ensure that little or no development occurs in primitive areas</li> <li>• Construct disability compliant trash collection facilities (and loading docks)</li> </ul>
Fiscal	<ul style="list-style-type: none"> <li>• Collect fees in all areas based on demand and cost recovery</li> <li>• Review price structure every 2 years</li> <li>• Update fee business plan within 2 years of ROD</li> </ul>

### 2.1.2.2 Additional Measures Applicable to the Individual Action Alternatives

In addition to the Plan Area measures presented in Section 2.1.2.1, the action alternatives contain specific measures that are described below and summarized in Table 2-2.

**Alternative 2: Recreation and Natural/Cultural Resource Protection Alternative**  
Under Alternative 2, the Plan Area actions identified in Section 2.1.2.1 would be adopted. Each of the management areas would also be assigned the following specific ROS classification that would be used to guide future



visitor use and other management decisions (e.g., levels of facilities construction, law enforcement):

- Mammoth—Semi-Primitive Motorized
- North Algodones Dunes—Semi-Primitive Non-Motorized
- Gecko—Rural
- Glamis—Roaded Natural
- Adaptive Management--Semi-Primitive Motorized
- Ogilby—Roaded Natural
- Dune Buggy Flats—Roaded Natural
- Buttercup—Rural
- Buffer—Semi-Primitive Motorized

These ROS classifications (by Management area) for this alternative, as well as the other action alternatives, are shown in Table 2-2. The management focus for Alternative 2 would be to ensure continued use of the ISDRA for OHV recreational opportunities, consistent with its designation as a Recreation Area, and to provide for the protection of natural and cultural resources.

A key component of Alternative 2 (see Table 2-2 at the end of this chapter) is the implementation of an adaptive management strategy coupled with biological resources monitoring of the proposed Adaptive Management Area. The adaptive management and monitoring program would include the development of a monitoring plan and analysis of the monitoring results to determine the impacts (if any) to species of concern as a result of recreational use of the ISDRA. Management of recreational use, especially in the Adaptive Management Area, would be evaluated periodically and revised as needed to achieve a balance of providing a motorized recreational opportunities and conserving species of concern. The special-status species to be monitored would be Peirson's milk-vetch (*Astragalus magdalenae* var. *peirsonii*), Algodones Dunes sunflower (*Helianthus niveus* ssp. *tephrodes*), and sand food (*Pholisma sonora*). OHV use would also be estimated and the data from the monitoring and the OHV estimated use would be used to develop management actions based on targeted visitor use, especially during the holiday weekends.

In addition, Alternative 2 would allow access to the Adaptive Management Area via permit only; and those entering the area for OHV recreational use would be required to pass a resource conservation exam. No facilities would be allowed in this area, and interpretive signs would be provided to educate OHV users about the sensitive natural and cultural resources in that area. Visitor use in the Adaptive Management Area would be limited to 75 OHV groups (defined as up to 7 vehicles per OHV group) per day (a maximum of 525 vehicles per day), for the first year of implementation.

Among the action alternatives (2, 3, and 4), this alternative is anticipated to result in the greatest likelihood of the meeting the project objectives (i.e., the



purpose and need as described in Section 1.1 of this DEIS). Therefore, Alternative 2 is considered the Preferred Alternative by BLM. Alternative 2 is shown in Figure 2-2.

### **Alternative 3: Natural and Cultural Resources Protection Alternative**

Under Alternative 3, the Plan Area actions identified in Section 2.1.2.1 would be adopted. Each of the management areas would also be assigned the following specific ROS classification that would be used to guide future visitor use and other management decisions (e.g., levels of facilities construction, law enforcement):

- Mammoth—Semi-Primitive Non-Motorized
- North Algodones Dunes—Semi-Primitive Non-Motorized
- Gecko—Roaded Natural
- Glamis—Semi-Primitive Motorized
- Adaptive Management—Semi-Primitive Non-Motorized
- Ogilby—Semi-Primitive Motorized
- Dune Buggy Flats—Semi-Primitive Motorized
- Buttercup—Roaded Natural
- Buffer—Semi-Primitive Non-Motorized

The Semi-Primitive Non-Motorized ROS classification of the proposed Mammoth, Adaptive, North Algodones Dunes, and Buffer Zone Management Areas would be Semi-Primitive Non-Motorized, resulting in the preclusion of OHV recreational activities in those areas. Law enforcement vehicles and staff, however, would be exempt from this prohibition. The name of the proposed Adaptive Management Area would be changed to reflect the management objectives associated with this alternative and discussed below. For the sake of consistency, however, the name “Adaptive Management Area” is retained for the analysis in this DEIS.

Alternative 3 would effectively provide a higher level and more immediate focus on natural and cultural resources in the ISDRA through the application of management actions that would effectively reduce OHV use. Monitoring would still occur under Alternative 3, but no adaptive management program permitting limited OHV use would be implemented. Because the Adaptive, Mammoth, and Buffer Zone Management Areas would have the same ROS category as the North Algodones Dunes Wilderness Management Area (Semi-Primitive Non-Motorized or SPNM), similar management objectives and actions would apply. Depending on the location within the ISDRA, this would result in two to three adjacent areas with the same or similar desired future conditions and goals, and uniformity of management direction over a larger area.

An increased number of notices (signs and kiosks) would be provided within and surrounding the proposed Mammoth, Buffer Zone, and Adaptive Management Area to minimize the potential for incidental trespass. In addition, an increase in the number of law enforcement staff would be



included as a management action, but this increase would be addressed by the planned staffing levels discussed in Section 2.1.2.1. The closure of the Mammoth, Buffer Zone, and Adaptive Management Areas to motorized recreation activity would provide the greatest level of assurance that sensitive natural and cultural resources would remain protected and would implement this protection upon adoption of the revised RAMP. Specifically, potential threats from OHV activity to the Peirson's milk-vetch and flat-tailed horned lizard would be avoided. Similarly, the possible degradation of as-yet undiscovered cultural resources in the Adaptive Management Area would potentially be avoided. The addition of approximately 89,700 acres to the SPNM ROS category would reduce the total area available to OHV activity at the ISDRA, and within the California Desert as a whole, by that number of acres.

Because the ROS classification of Semi-Primitive Non-Motorized in the Adaptive Management Area would close this area to motorized recreation activity, permits and test requirements would not be management actions contemplated for the Adaptive Management Area under Alternative 3. Alternative 3 is shown in Figure 2-3.

#### **Alternative 4: Motorized Recreation Opportunities Alternative**

Under this alternative, the management actions for the Glamis Management Area would be responsive to public input (see Chapter 1) that emphasizes a need for additional motorized recreational opportunities beyond that provided by any of the other alternatives discussed above. Therefore, management measures would be directed at allowing an increased intensity of OHV activity relative to the visitor use baseline established in this DEIS. The increased intensity of use facilitated by Alternative 4 would serve to accommodate existing and future OHV recreational demand at ISDRA by increasing the overall visitor supply, as well as by shifting the areas of use. In addition, Alternative 4 would provide an altered type of recreation experience at the ISDRA (greater densities would be allowed for camping compared with the other alternatives).

Under Alternative 4, the Plan Area actions identified in Section 2.1.2.1 would be adopted. Each of the management areas would also be assigned the following specific ROS classification that would be used to guide future visitor use and other management decisions (e.g., levels of facilities construction, law enforcement):

- Mammoth—Roaded Natural
- North Algodones Dunes—Semi-Primitive Non-Motorized
- Gecko—Urban
- Glamis—Rural
- Adaptive Management—Roaded Natural
- Ogilby—Rural
- Dune Buggy Flats—Rural
- Buttercup—Urban



- **Buffer—Semi-Primitive Motorized**

The ROS classifications assigned to most proposed management areas would be consistent with a desired moderate-to-high level of OHV recreational use. The ROS for the Adaptive Management Area would be Roaded Natural and that for the Glamis Management Area would be Rural, both resulting in increased OHV recreational use. The assignment of a Rural ROS category in the Glamis Management Area would be accompanied by management actions that reflect this desired future condition. This includes facilities to accommodate increased visitation such as new campgrounds, camping pads, toilets, trash stations, and information kiosks. No additional law enforcement staff beyond those proposed for in Table 2-1 would be required. Alternative 4 is shown in Figure 2-4.

## **2.2 ALTERNATIVES CONSIDERED BUT ELIMINATED**

This section presents the alternatives that were considered for analysis in this DEIS but eliminated from further consideration. Overall, the primary reason that they were not carried forward for detailed analysis is that they would not meet the purpose and need of the BLM's proposed action. Although these alternatives are not evaluated in detail, issues of concern raised by the public in the scoping meetings and in other forums (see Section 1.4) are included in several of the alternatives described above and evaluated in Chapter 4.

### **2.2.1 Hybrid Recreation Intensive Alternative**

The Hybrid Recreation Intensive Alternative would open the majority of the ISDRA to motorized and nonmotorized recreational opportunities with the exception of the Wilderness Area and certain closed areas.

The Hybrid Recreation Intensive Alternative would:

- Implement several northwest-southeast trending permanent closure areas for resource protection along the western dune boundary. These closures would be traversed at periodic locations by OHV corridors, associated with Coachella Canal drop bridges, allowing motorized access to the interior dunes.
- Establish a single larger east-west closure for resource protection traversed by two north-south OHV corridors.
- Install fencing along naturally occurring valleys at the base of dunes to increase compliance and decrease maintenance

#### **Rationale for Rejection**

The primary reason for rejection of this alternative is that it does not meet the purpose and need to maintain habitat requirements for special-status species (see Sections 1.1.1 and 1.1.2 of this DEIS). Specifically, habitat fragmentation would result from implementation of this alternative. Although this alternative provides for closure of certain areas of the ISDRA to OHV



## 2.2.2 Total Closure Alternative

use, these closures would fragment existing sensitive species populations by allowing multiple areas at which to traverse the dunes by motorized vehicles.

The Total Closure Alternative would implement a complete exclusion of OHV use in the ISDRA with the intent of maximizing natural and cultural resource protection.

The Total Closure Alternative would be defined by the following characteristics:

- The entirety of the ISDRA would be closed to motorized recreational opportunities.
- Existing road access to the ISDRA would be maintained, but roads would not be expanded/improved.
- Existing campsites would be retained, but campsites would not be added or improved.
- Permits for vending opportunities would not be issued
- Natural resource monitoring would not occur and inventories of plant, wildlife, and cultural resource inventories would not be conducted.

### Rationale for Rejection

The primary reason for rejecting this alternative is that it does not meet the purpose and need for the action contemplated by the BLM (i.e., preparing a revised RAMP). Specifically, a total closure alternative would not:

- Conform to the CDPA intent to provide for continued OHV use at the ISDRA (see Section 1.3.3)
- Provide the opportunity for OHV recreational activities in accordance with the intent of the CDCA Plan. (The CDCA Plan specifically designates the ISDRA as an open area for OHVs and the ISDRA has been managed for this use since the early 1970s)
- Meet the BLM's specific goals for the action evaluated of this DEIS (i.e., provide a variety of sustainable OHV and other recreational activities (see Section 1.4.3)
- Identify the type and level of visitor services, including facilities, needed to support desired visitor use
- Institute measures to achieve desired visitor use levels or accommodate service providers in the ISDRA.

In addition, total closure of the ISDRA is not required to ensure protection of sensitive species at the ISDRA (see Section 2.2.3 below). Measures for protection of these resources are incorporated into several of the alternatives considered in detail in this DEIS.



### 2.2.3 Interim Management Alternative

Under the Interim Management Alternative, the ISDRA would continue to be managed according to the existing and approved management plan and policies (i.e., the 1987 RAMP). This alternative would include policies implemented since the 1987 RAMP, including designation of the North Algodones Sand Dunes Wilderness in 1994, and release of WSA 362 from further studies to determine suitability for wilderness designation. In addition, this alternative would include the recent interim actions of the negotiated settlement agreement that stipulate interim closure of certain areas at the ISDRA (i.e., those measures taken to provide protection for endangered and threatened species)—see Section 1.3.5 for a discussion of the interim closure.

Characteristics of the Interim Management Alternative include the following:

- No adaptive management of ISDRA
- Permanent Northern Closure (approximately 3,802 acres), located just south of Mammoth Wash
- Permanent Central Closure Number 1 (approximately 2,000 acres), located east of Gecko Road
- Permanent Central Closure Number 2 (approximately 42,763 acres), located in the center of the Glamis/Gecko area
- Permanent Southern Closure (approximately 160 acres), located south of I-8 in the northwestern portion of Buttercup
- Permanent closure of eastern area to camping (approximately 25,600 acres of desert tortoise habitat)

#### Rationale for Rejection

The primary reason for rejecting this alternative is that interim closures (as stipulated in the settlement agreement) are not required for adequate protection of sensitive species. A settlement agreement was developed in November 2000 with plaintiffs (Center for Biological Diversity and others) to establish interim actions to protect endangered and threatened species pending completion of USFWS consultation on the CDCA Plan in total. Prior to November 2, 2000, the BLM did not have the results of monitoring to assess adequately the status of sensitive species addressed by the settlement agreement. The results of the monitoring conducted since November 2000 and other data collected prior to November 2000 and assessed after the settlement agreement indicate that continuing the interim closures is not necessary to ensure adequate protection for the species of concern. For further support of the rationale for eliminating this alternative, see Appendix B.



Table 2-2 Management Actions for the Action Alternatives

MANAGEMENT AREAS	ALTERNATIVE 1 NO ACTION	ALTERNATIVE 2 RECREATION AND RESOURCE PROTECTION	ALTERNATIVE 3 NATURAL/CULTURAL	ALTERNATIVE 4 RECREATION
Mammoth	<ul style="list-style-type: none"> <li>1987 RAMP would remain in effect, including policies implemented in the interim between 1987 and 2002 (see Section 2.2.1)</li> <li>Interim closure to OHV use not included as part of No Action</li> <li>No ROS classifications or management area designations assigned</li> <li>No revised biological monitoring or adaptive management program</li> <li>No increase in law enforcement</li> <li>No visitor use targets established</li> </ul> <p>No amendment to the CDCA Plan</p>	<ul style="list-style-type: none"> <li>Semi-primitive Motorized ROS</li> <li>Establish visitor use ranges to achieve low OHV use and retain semi-primitive characteristics</li> <li>Conduct recreation satisfaction survey</li> <li>Develop outreach program on habitat conservation and protection</li> <li>Establish environmental ethics program</li> <li>Patrol by rangers would not be on a regular basis</li> </ul>	<ul style="list-style-type: none"> <li>Semi-primitive Non- Motorized ROS</li> <li>Establish visitor use ranges to achieve low OHV use and retain semi-primitive characteristics</li> <li>Conduct recreation satisfaction survey</li> <li>Develop outreach program on habitat conservation and protection</li> <li>Establish environmental ethics program</li> <li>Patrol by rangers would not be on a regular basis</li> </ul>	<ul style="list-style-type: none"> <li>Roaded Natural ROS</li> <li>Establish visitor use ranges to allow moderate OHV use and retain semi-primitive characteristics</li> <li>Conduct recreation satisfaction survey</li> <li>Develop outreach program on habitat conservation and protection</li> <li>Establish environmental ethics program</li> <li>Patrol by rangers would not be on a regular basis</li> </ul>
North Algodones Dunes	<ul style="list-style-type: none"> <li>No Action conditions would apply throughout ISDRA</li> </ul>	<ul style="list-style-type: none"> <li>Semi-Primitive Non-Motorized ROS</li> <li>Update kiosks at watchable wildlife site</li> <li>No motorized access allowed except law enforcement and to maintain wildlife guzzlers.</li> </ul>	<ul style="list-style-type: none"> <li>Semi-Primitive Non-Motorized ROS</li> <li>Update kiosks at watchable wildlife site</li> <li>No motorized access allowed except law enforcement and to maintain wildlife guzzlers.</li> </ul>	<ul style="list-style-type: none"> <li>Semi-Primitive Non-Motorized ROS</li> <li>No motorized access allowed except law enforcement and to maintain wildlife guzzlers.</li> </ul>
Gecko	<ul style="list-style-type: none"> <li>No Action conditions would apply throughout ISDRA</li> </ul>	<ul style="list-style-type: none"> <li>Rural ROS</li> <li>Close Osbourne Overlook to camping</li> <li>Implement fee entry and construct traffic control area at Gecko Road</li> </ul>	<ul style="list-style-type: none"> <li>Roaded Natural ROS</li> <li>Close Osbourne Overlook to camping</li> <li>Implement fee entry and construct traffic control area at Gecko Road</li> <li>Resurface and maintain Osbourne Overlook</li> </ul>	<ul style="list-style-type: none"> <li>Urban ROS</li> <li>Osbourne Overlook would remain open to camping</li> <li>Implement fee entry and construct traffic control area at Gecko Road</li> <li>Construct ranger station at Osbourne Overlook</li> </ul>



**Alternatives for  
ISDRA Management**

**Table 2-2 Management Actions for the Action Alternatives**

MANAGEMENT AREAS	ALTERNATIVE 1 NO ACTION	ALTERNATIVE 2 RECREATION AND RESOURCE PROTECTION	ALTERNATIVE 3 NATURAL/CULTURAL	ALTERNATIVE 4 RECREATION
		<ul style="list-style-type: none"> <li>Construct ranger station at Osbourne Overlook</li> <li>Resurface and maintain Osbourne Overlook</li> <li>Construct parking lot at base of Osbourne Overlook</li> </ul>	<ul style="list-style-type: none"> <li>Construct parking lot at base of Osbourne Overlook</li> </ul>	<ul style="list-style-type: none"> <li>Resurface and maintain Osbourne Overlook</li> <li>Construct parking lot at base of Osbourne Overlook</li> </ul>
Glamis	<ul style="list-style-type: none"> <li>No Action conditions would apply throughout ISDRA</li> </ul>	<ul style="list-style-type: none"> <li>Roaded Natural ROS</li> <li>Low-to-moderate visitor use goal</li> <li>Allow camping east of Glamis and the RR tracks</li> <li>Apply and maintain dust palliative on the wash road</li> <li>Grade the roads regularly</li> <li>Construct pit toilets in Glamis Flats and Washes areas</li> <li>Close Oldsmobile Hill, Competition Hill from sundown to sunup</li> </ul>	<ul style="list-style-type: none"> <li>Semi-Primitive Motorized ROS</li> <li>Low-to-moderate visitor use goal</li> <li>Allow camping east of Glamis and the RR tracks</li> <li>Apply and maintain dust palliative on the wash road</li> <li>Grade the roads regularly</li> <li>Construct pit toilets in Glamis Flats and Washes areas</li> <li>Close Oldsmobile Hill, Competition Hill from sundown to sunup</li> </ul>	<ul style="list-style-type: none"> <li>Rural ROS</li> <li>Increase OHV opportunities in Glamis Management Area</li> <li>Moderate-to high visitor use goal</li> <li>New campgrounds, camping pads, pit toilets, trash stations, and information kiosks to accommodate increase visitor use goals</li> </ul>
Adaptive Management	<ul style="list-style-type: none"> <li>No Action conditions would apply throughout ISDRA</li> </ul>	<ul style="list-style-type: none"> <li>Semi-Primitive Motorized ROS classification</li> <li>Establish visitor use capacity-exceedance targets</li> <li>Data collection on ISDRA use and willingness to pay</li> <li>Limit ISDRA use of OHVs if visitation exceeds proposed ROS classifications (over 15% of the season, capacity will be limited to ensure that ROS management objectives are met.)</li> <li>Develop a biological monitoring program, including adaptive management for</li> </ul>	<ul style="list-style-type: none"> <li>Semi-Primitive Non-Motorized ROS</li> <li>Management focus on avoidance of impacts to natural/cultural resources</li> <li>No use of motorized vehicles (except for law enforcement)</li> <li>Visitor use would be limited to non-motorized use</li> <li>No adaptive management program implemented/no monitoring conducted</li> <li>Future management would include measures comparable to North Algodones Dunes Management Area</li> </ul>	<ul style="list-style-type: none"> <li>Roaded Natural ROS</li> <li>Establish visitor use capacity-exceedance targets</li> <li>Data collection on ISDRA use and willingness to pay</li> <li>Limit ISDRA use of OHVs if visitation exceeds proposed ROS classifications (over 15% of the season, capacity will be limited to ensure that ROS management objectives are met.)</li> <li>Develop a biological monitoring program, including adaptive management for species of concern in the ISDRA.</li> <li>A low visitor density would be</li> </ul>



Table 2-2 Management Actions for the Action Alternatives

MANAGEMENT AREAS	ALTERNATIVE 1 NO ACTION	ALTERNATIVE 2 RECREATION AND RESOURCE PROTECTION	ALTERNATIVE 3 NATURAL/CULTURAL	ALTERNATIVE 4 RECREATION
		<ul style="list-style-type: none"> <li>species of concern in the ISDRA.</li> <li>A low visitor density would be established</li> </ul>	<ul style="list-style-type: none"> <li>Increase in law enforcement staff and signage to minimize potential for trespass</li> </ul>	<ul style="list-style-type: none"> <li>established</li> </ul>
Ogilby	<ul style="list-style-type: none"> <li>No Action conditions would apply throughout ISDRA</li> </ul>	<ul style="list-style-type: none"> <li>Roaded Natural ROS</li> <li>Low-to-intense concentration of OHV recreation activity</li> <li>Allow camping and OHV use</li> <li>No road improvements would be implemented</li> <li>No recreational facilities or other developments would be constructed</li> <li>Outreach programs for habitat conservation and resource protection would be implemented</li> </ul>	<ul style="list-style-type: none"> <li>Semi-Primitive Motorized ROS</li> <li>Low-to-intense concentration of OHV recreation activity</li> <li>Allow neither camping nor OHV use</li> <li>No road improvements would be implemented</li> <li>No recreational facilities or other developments would be constructed</li> <li>Outreach programs for habitat conservation and resource protection would be implemented</li> </ul>	<ul style="list-style-type: none"> <li>Rural ROS</li> <li>Moderate-to-intense concentration of OHV recreation activity</li> <li>Allow camping and OHV use</li> <li>No road improvements would be implemented</li> <li>No recreational facilities or other developments would be constructed</li> </ul>
Dune Buggy Flats	<ul style="list-style-type: none"> <li>No Action conditions would apply throughout ISDRA</li> </ul>	<ul style="list-style-type: none"> <li>Roaded Natural ROS</li> <li>Apply and maintain dust palliative on the wash road</li> <li>Grade the entrance roads</li> <li>Construct pit toilets</li> </ul>	<ul style="list-style-type: none"> <li>Semi-Primitive Motorized ROS</li> <li>Apply and maintain dust palliative on the wash road</li> <li>Grade the entrance roads</li> <li>Construct pit toilets</li> </ul>	<ul style="list-style-type: none"> <li>Rural ROS</li> <li>Apply and maintain dust palliative on the wash road</li> <li>Grade the entrance roads</li> <li>Construct pit toilets</li> </ul>
Buttercup	<ul style="list-style-type: none"> <li>No Action conditions would apply throughout ISDRA</li> </ul>	<ul style="list-style-type: none"> <li>Rural ROS</li> <li>Designate camping sites based on results of pilot reservation program at the Gecko Management area</li> <li>Designate interpretive area near Greys Well Rd with parking and facilities</li> <li>Construct semipermanent law enforcement facility (parking and helipad, storage area)</li> <li>Construct interpretive facilities</li> </ul>	<ul style="list-style-type: none"> <li>Roaded Natural ROS</li> <li>Designate no additional camping sites</li> <li>Designate interpretive area near Greys Well Rd with parking and facilities</li> <li>Construct semipermanent law enforcement facility (parking and helipad, storage area)</li> <li>Construct interpretive facilities near Greys Well Road</li> </ul>	<ul style="list-style-type: none"> <li>Urban ROS</li> <li>Designate camping sites based on results of pilot reservation program at the Gecko Management area</li> <li>Designate interpretive area near Greys Well Rd with parking and facilities</li> <li>Construct semipermanent law enforcement facility (parking and helipad, storage area)</li> <li>Construct interpretive facilities near Greys Well Road</li> </ul>

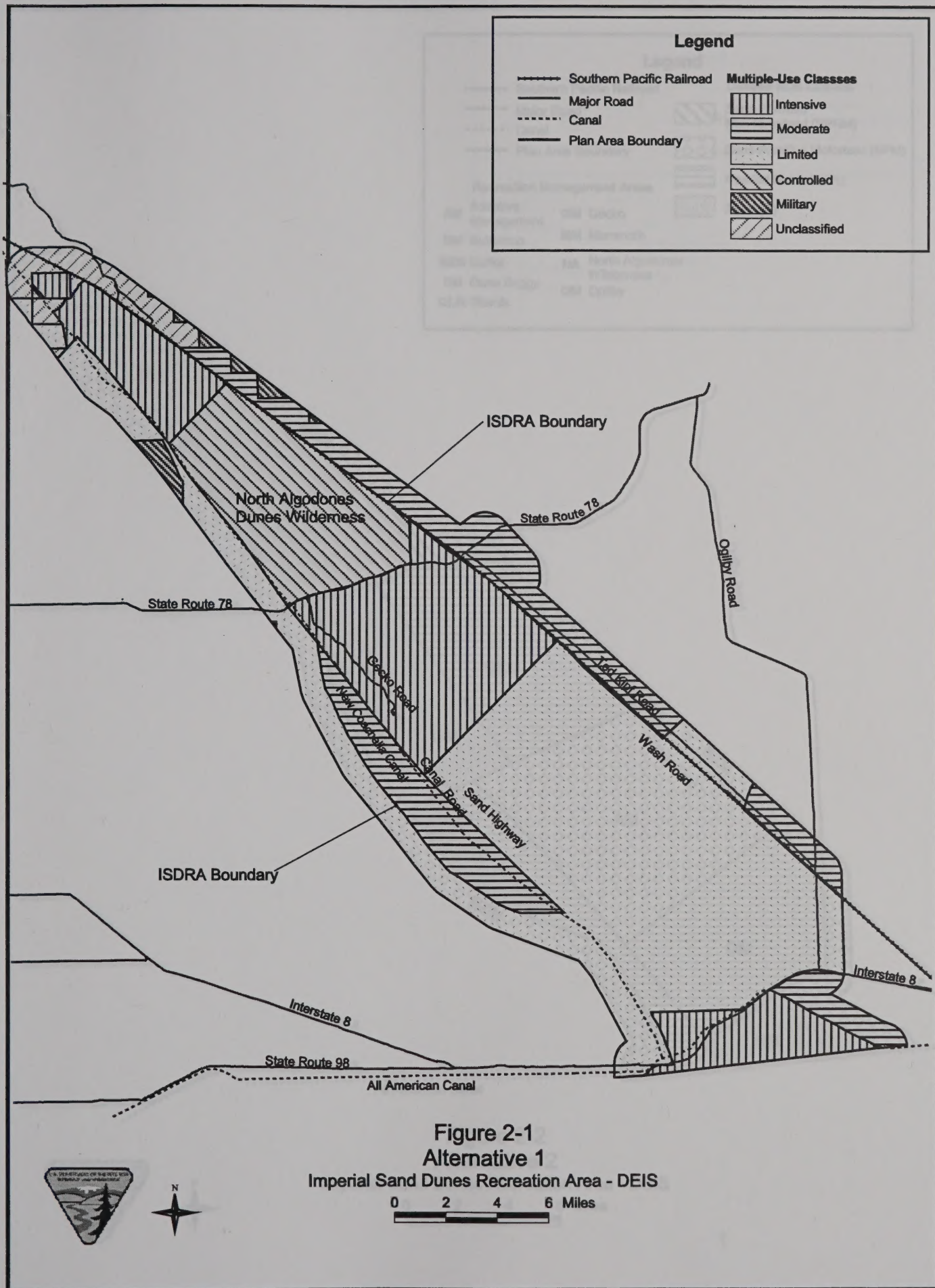


**Alternatives for  
ISDRA Management**

**Table 2-2 Management Actions for the Action Alternatives**

MANAGEMENT AREAS	ALTERNATIVE 1 NO ACTION	ALTERNATIVE 2 RECREATION AND RESOURCE PROTECTION	ALTERNATIVE 3 NATURAL/CULTURAL	ALTERNATIVE 4 RECREATION
		near Greys Well Road		
Buffer	<ul style="list-style-type: none"> <li>Same No Action conditions would apply throughout ISDRA</li> </ul>	<ul style="list-style-type: none"> <li>Semi-Primitive Motorized</li> <li>1-mile buffer around ISDRA</li> <li>No camping</li> <li>Motorized recreation limited to existing roads and trails</li> <li>Additional signage for no camping designation and limited road use</li> </ul>	<ul style="list-style-type: none"> <li>Semi-Primitive Non-Motorized</li> <li>1-mile buffer around ISDRA</li> <li>No camping</li> <li>Motorized recreation limited to existing roads and trails</li> <li>Additional signage for no camping designation and limited road use</li> </ul>	<ul style="list-style-type: none"> <li>Semi-Primitive Motorized</li> <li>1-mile buffer around ISDRA</li> <li>No camping</li> <li>Motorized recreation limited to existing roads and trails</li> <li>Additional signage for no camping designation and limited road use</li> </ul>

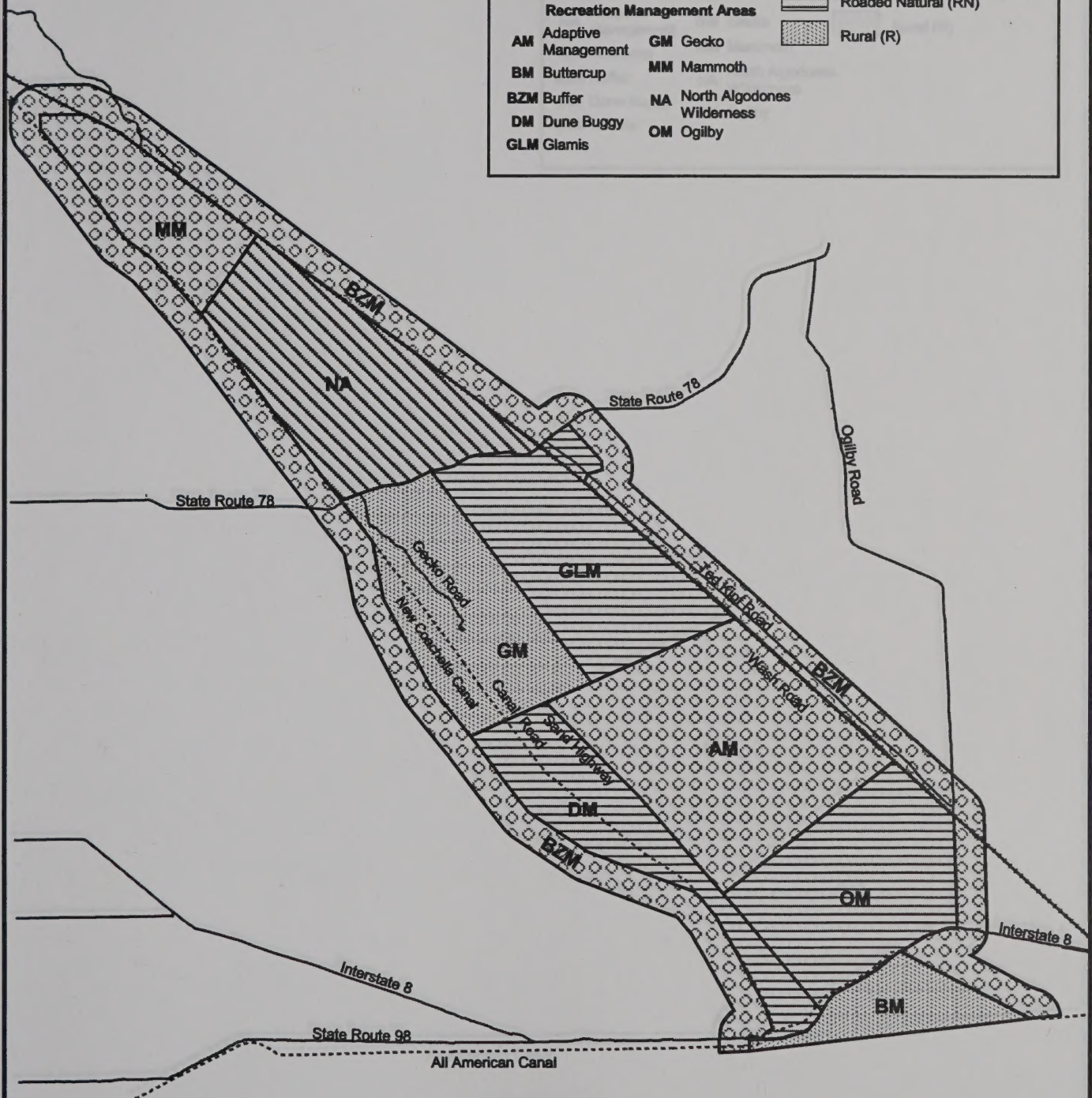
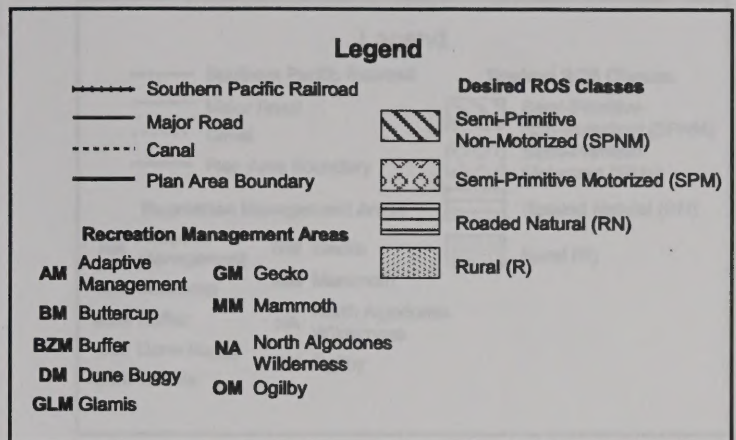












**Figure 2-2**  
**Alternative 2**  
**Imperial Sand Dunes Recreation Area - DEIS**

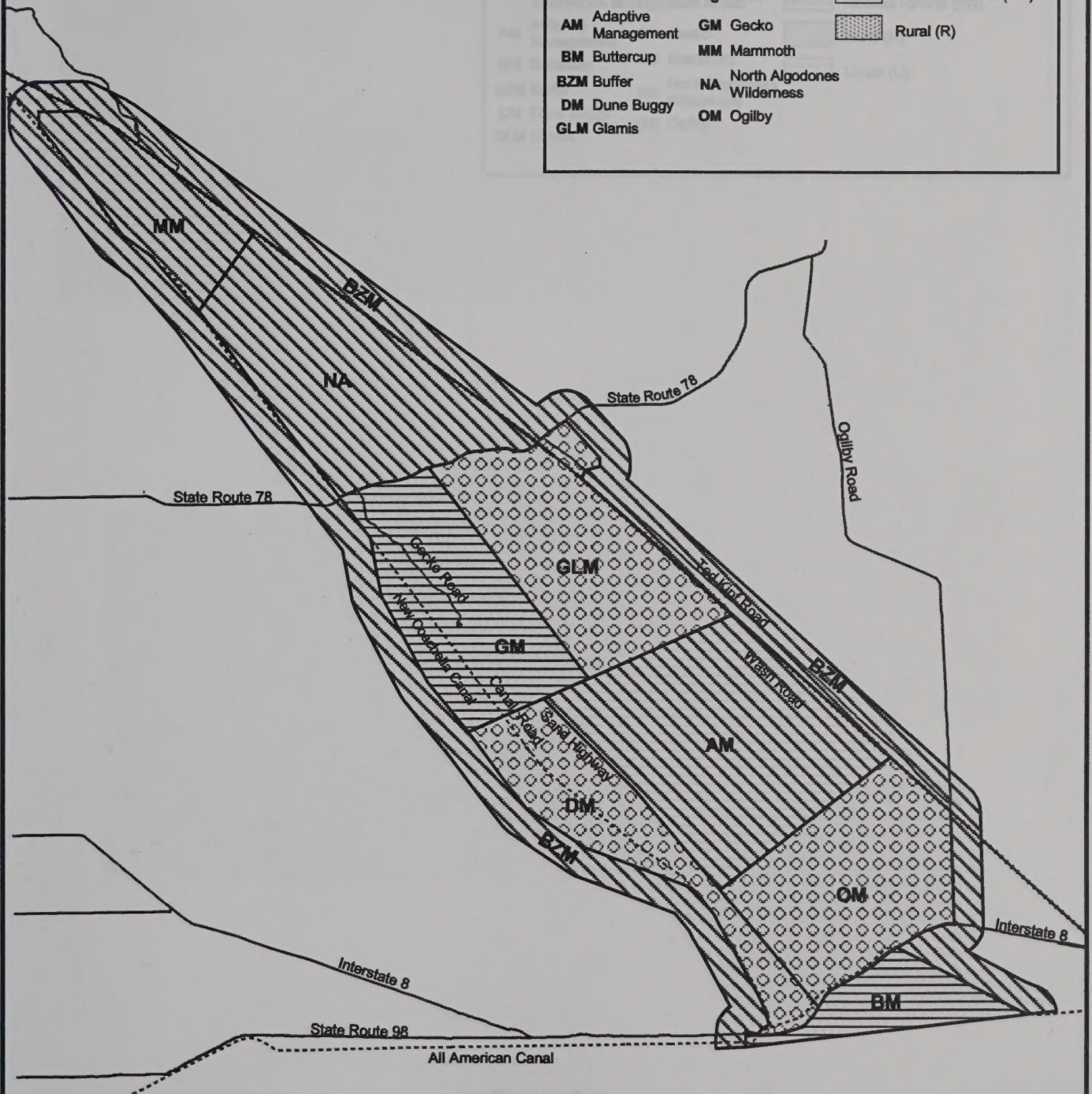
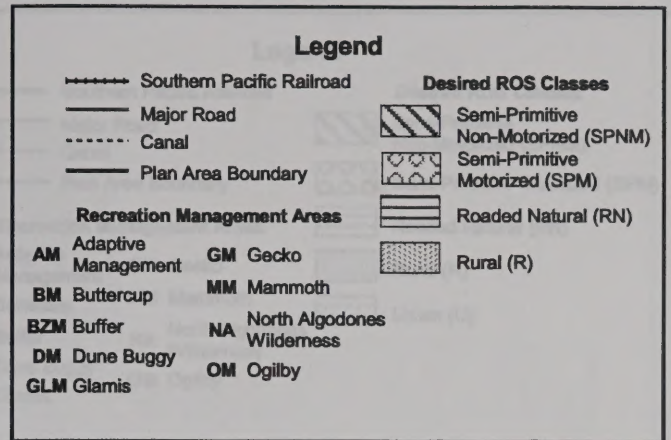


0 2 4 6 Miles









**Figure 2-3**  
**Alternative 3**  
 Imperial Sand Dunes Recreation Area - DEIS

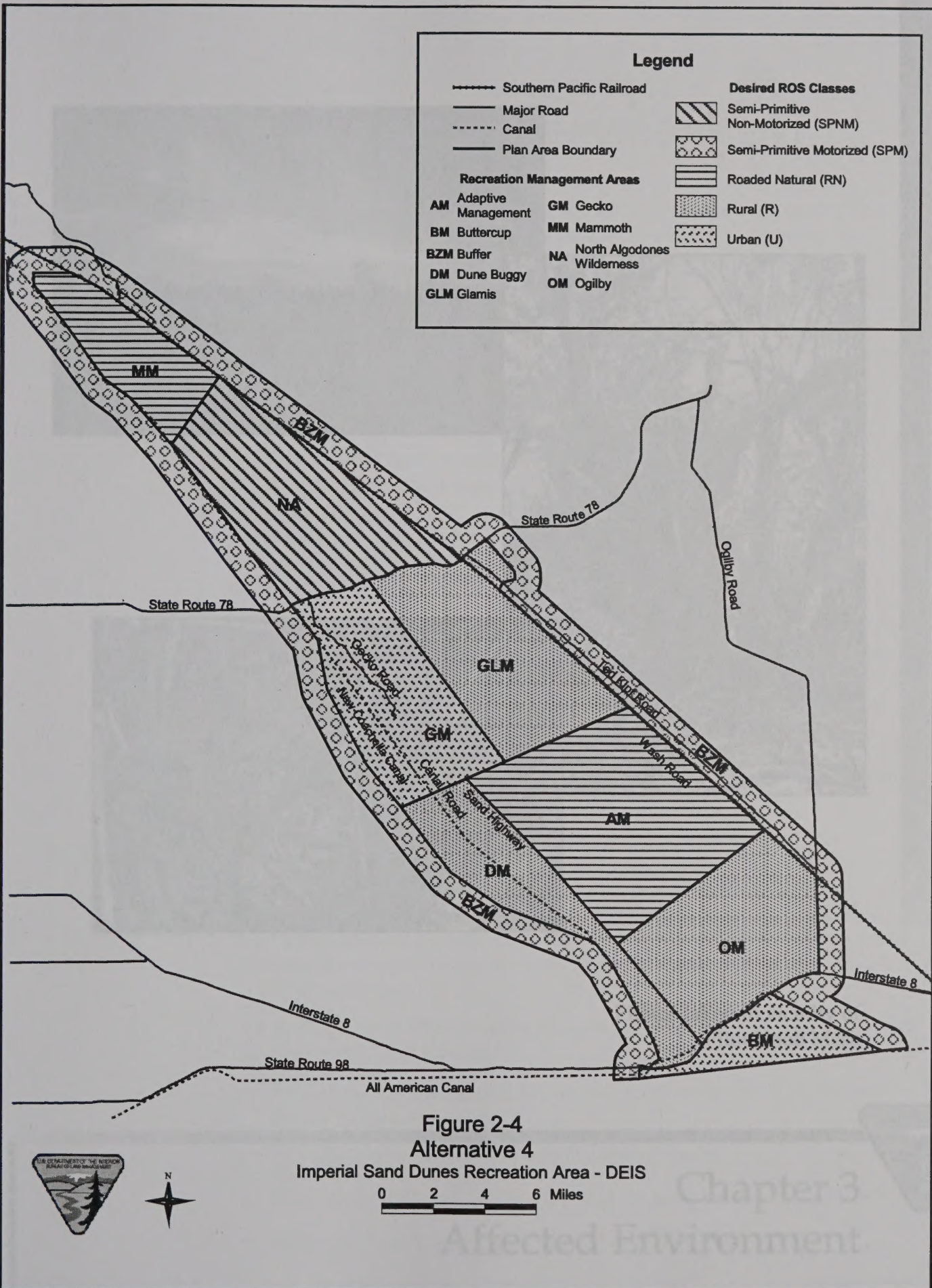


0 2 4 6 Miles















## CHAPTER 3.0

# ENVIRONMENT

The affected environment for the Plan is the following resource categories:

- Cultural Resources (Section 3.1.1)
- Transportation and Traffic (Section 3.1.2)
- Noise (Section 3.1.3)
- Air Quality (Section 3.1.4)
- Hazardous Materials (Section 3.1.5)
- Geology, Energy, and Mining (Section 3.1.6)



Photos taken in vicinity of  
Pilot Knob Mesa

## Chapter 3 Affected Environment





Photos taken in vicinity of  
Pilot Knob Mine

## Affected Environment Chapter 3





## CHAPTER 3.0

# AFFECTED ENVIRONMENT

This chapter presents a description of the affected environment for the Plan Area and vicinity. It is organized into the following resource categories:

- Recreation (Section 3.1)
- Biological Resources (Section 3.2)
- Law Enforcement and Public Safety (Section 3.3)
- Socioeconomics (Section 3.4)
- Land Use and Land Ownership (Section 3.5)
- Visual Resources (Section 3.6)
- Water Resources (Section 3.7)
- Cultural Resources (Section 3.8)
- Transportation and Traffic (Section 3.9)
- Noise (Section 3.10)
- Air Quality (Section 3.11)
- Hazardous Materials (Section 3.12)
- Geology, Energy, and Mineral Resources (Section 3.13)

For the purpose of preparing the analysis provided in Chapter 4 of this DEIS, the baseline affected environment is defined as those conditions that existed prior to implementation of the temporary OHV and camping closures, referred to as “Current Conditions” (see Section 1.3.5 and Figure 1-3). The last full recreation season at ISDRA in which these conditions occurred was October 1, 1999, to September 30, 2000. During this time period, management activities at ISDRA were conducted in accordance with the 1987 RAMP.

The Imperial Sand Dune system is divided into three main areas. The northernmost area is known as Mammoth Wash. South of Mammoth Wash and north of SR-78 is the North Algodones Dunes Wilderness, a 32,240-acre preserve established by the 1994 CDPA. This area is closed permanently to OHVs and other mechanized use, with hiking and horseback access permitted. The largest and most heavily used OHV area is located south of SR-78, and continues south past I-8.

Areas within the ISDRA currently designated for OHV use by the CDCA Plan and the 1987 RAMP include:

- That portion of Mammoth Wash located north of the North Algodones Dunes Wilderness
- The Glamis/Gecko area, located just south of SR-78
- Dune Buggy Flats and Ogilby located in the southern portion of ISDRA
- Buttercup, located south of I-8, near the border of Mexico



## Affected Environment

The following sections provide further detail on the baseline conditions at ISDRA, based on 13 distinct but interrelated resource categories.

This chapter presents a description of the affected environment for the Plan Area and vicinity. It is organized into the following resource categories:

- Recreation (Section 3.1)
- Biological Resources (Section 3.2)
- Land Use, Planning, and Public Safety (Section 3.3)
- Socioeconomics (Section 3.4)
- Land Use and Land Ownership (Section 3.5)
- Visual Resources (Section 3.6)
- Water Resources (Section 3.7)
- Cultural Resources (Section 3.8)
- Transportation and Traffic (Section 3.9)
- Noise (Section 3.10)
- Air Quality (Section 3.11)
- Hazardous Materials (Section 3.12)
- Geology, Seismicity, and Mineral Resources (Section 3.13)

For the purpose of preparing the analysis presented in Chapter 4 of this DEIS, the baseline affected environment is defined as those conditions that existed prior to implementation of the proposed OHV and canopy systems, referred to as "Current Conditions" (see Section 1.3.2 and Figure 1-3). The last full recreation season at ISDRA in which these conditions occurred was October 1, 1995, to September 30, 2000. During this time period, management activities at ISDRA were conducted in accordance with the 1987 RAMP.

The Imperial Sand Dunes system is divided into three main areas. The northeastern area is known as Mammoth Wash. South of Mammoth Wash and north of SR-78 is the North Algodones Dunes Wilderness, a 12,340-acre preserve established by the 1994 CDA. This area is closed permanently to OHVs and other mechanized use, with hiking and horseback access permitted. The largest and most heavily used OHV area is located south of SR-78, and extends south past I-8.

Areas within the ISDRA currently designated for OHV use by the CDA Plan and the 1987 RAMP include:

- The portion of Mammoth Wash located north of the North Algodones Dunes Wilderness
- The Glamis/Globe area located just south of SR-78
- Dunes Buggy Plan and Gilby located in the southern portion of ISDRA
- Buttercup, located south of I-8, near the border of Mexico



### 3.1 RECREATIONAL RESOURCES

#### 3.1.1 Introduction

The ISDRA is a highly valued and unique recreation resource within the southwestern United States for two reasons: (1) it is a sand dune ecosystem of a size and height that are unparalleled, and (2) it fills a unique and valued niche for providing the largest acreage of semi-primitive OHV recreation opportunities in the United States. The ISDRA has far more acreage than the 10 other dune areas<sup>1</sup> that are located within 1,500 miles.

Recreation resources within the ISDRA are managed to provide safe and enjoyable "recreation opportunities" to the public. A recreation opportunity is commonly defined as the opportunity for a person to participate in a particular activity in a specific setting to attain a preferred type of experience and subsequent benefits.

The ISDRA is managed to provide both non-motorized and motorized recreational opportunities to area residents and visitors. The motorized recreational use is in the form of OHV use. The OHV use encompasses many types of desired motorized recreation opportunities, such as all-terrain vehicles (ATVs), dune buggies, and dirt bikes.

In addition to OHV use, the ISDRA provides other recreational opportunities including hiking, horseback riding, wildlife and scenery viewing, picnicking, photography, nature study and environmental education, camping, sightseeing, and driving for pleasure.

Provided below is a discussion of the regulatory framework of the BLM and a description of the recreation resources of the ISDRA.

#### 3.1.2 Regulatory Framework

Since its designation, the ISDRA has been managed according to mandates set forth in both the 1980 CDCA and 1976 FLPMA. Among FLPMA's requirements is:

##### 3.1.2.1 California Desert Conservation Act Plan of 1980

*...the use of all California desert resources can and should be provided for in a multiple use and sustained yield management plan to conserve these resources for future generations, and to provide present and future use and enjoyment, particularly outdoor recreation uses, including the use, where appropriate, of off-road recreational vehicles... [Title VI. SC1781. Sec. 601 (a)(4)].*

The CDCA Plan of 1980, as amended provides overall management direction for all public lands in the CDCA. The CDCA Plan's Recreation Element lists several goals, as follows:

- Provide for a wide range of quality recreation opportunities and experiences emphasizing dispersed undeveloped use.

<sup>1</sup> The 10 dune areas referred to are located in California, Arizona, Nevada, and Utah.



- Provide a minimum of recreation facilities. Those facilities should emphasize resource protection and visitor safety.
- Manage recreation use to minimize user conflicts, provide a safe recreation environment, and protect desert resources.
- Emphasize the use of public information and education techniques to increase public awareness, enjoyment, and sensitivity to desert resources.
- Adjust management approach to accommodate changing visitor use patterns and preferences.
- Adjust management approach to accommodate changing visitor use patterns and preferences.
- Encourage the use and enjoyment of desert recreation opportunities by special populations, and provide facilities to meet the needs of those groups (BLM, 1980).

To manage the desert resources, the CDCA Plan divided the ISDRA into Multiple-Use Classes that stipulate whether different areas could be used recreationally and the intensity of that use. Because these classes are legally binding, unless amended through the public process, the BLM must manage the ISDRA according to the class prescriptions. The Multiple-Use Classes assigned to the ISDRA are as follows (Figure 3.1-1):

- Multiple-Use Class I – “Intensive Use”: Its purpose is to provide for concentrated use of land and resources to meet human needs. Reasonable protection will be provided for sensitive natural and cultural values. Mitigation of impacts on resources will be implemented, and rehabilitation of impacted areas will occur, if possible. Recreation activities involving high densities are permitted. Campgrounds and other facilities are permitted. Lands assigned to Class I incorporate OHV areas within the ISDRA designated as “open.” These areas include: the majority of the Mammoth Wash area, the Glamis/Gecko area, the Dune Buggy Flats area, and the Buttercup area. The management objective of these areas is to enhance opportunities for OHV recreation.
- Multiple-Use Class M – “Moderate Use”: Based upon a controlled balance between higher intensity use and protection of public lands. This class provides for a wide variety of present and future uses such as mining, livestock grazing, recreation, energy, and utility development. This class is also designed to conserve desert resources and to mitigate damage to those resources that permitted uses may cause. Recreational use is appropriate at moderate to high densities, and developed recreation sites are permitted. Lands assigned to Class M incorporate OHV areas within the ISDRA designated as “limited.” However, identifying individual vehicle routes within sand dunes is impractical; therefore, areas assigned Class M generally are designated as “open” or “closed.” The exception is the South Ogilby Dunes area (classified M), which is designated as “limited to



existing routes.” East Mesa south of SR-78, the area east of Glamis, and South Ogilby Dunes were placed in Class M.

- **Multiple-Use Class L – “Limited Use”:** This class protects sensitive, natural, scenic, ecological, and cultural resource values. These lands are managed to provide for generally lower intensity, carefully controlled multiple use of resources, while ensuring that sensitive values are not significantly diminished. The South Algodones Dunes, formerly WSA 362, preliminarily was designated Class C, but since has been removed from consideration and is now designated Class L. The CDCA assigned much of the central dunes and Pilot Knob Mesa to this class to protect sensitive plant and wildlife habitat. East Mesa north of SR-78 also was placed in Class L. This class is suitable for recreation that generally involves low- to moderate-user densities. Developed campgrounds or sites involving concentrated recreational use generally are not allowed in this class. Lands assigned to Class L incorporate OHV areas within the ISDRA designated as “limited.” However, identifying individual vehicle routes within sand dunes is impractical; therefore, areas assigned Class L generally are designated as “open” or “closed.” The exception is the Pilot Knob Mesa (not a sand dune area – classified L), which is designated as “open.” The OHV areas within the ISDRA classified as Class L and designated “open” include the Central Dunes area south of the Glamis/Gecko area, including former WSA 362 and the Ogilby Campsite area. OHV use in the Central Dunes area traditionally has been limited to access between the Glamis/Gecko and Buttercup areas (Class I areas) on the sand highway, and has occurred at low levels. The Central Dunes area was designated “open” to provide for OHV access between these two intensively used areas. To limit use of this movement corridor, the BLM decided not to improve the area to allow for two-wheel drive access or additional campgrounds.
- **Multiple-Use Class C – “Controlled Use”:** There are two purposes to this class: it shows areas that are being “preliminarily recommended” as suitable for wilderness designation by Congress and it shows those areas formally designated as wilderness by Congress. The North Algodones Sand Dunes Wilderness was designated wilderness in the CDCA Plan through the California Desert Protection Act of 1994.

As previously discussed, areas within the ISDRA are currently designated for OHV use by the CDCA Plan and the 1987 RAMP. Lands classified as Class L or M generally are designated as “Limited” for OHV use under the CDCA. However, within sand dune areas, lands are designated either “Open” or “Closed” regardless of MUCs. This is because the topographic or other land characteristics that make management of limited use areas practical generally do not exist on open dune fields. Exceptions to the avoidance of limited use designations in the Plan Area include the dunes at South Ogilby, which are “Limited to Existing Routes,” and Pilot Knob Mesa (not a dune area), which is designated as “Open” Class L. The North Algodones Dunes Wilderness



(Class C) is closed to OHV use, as is East Mesa lands surrounding U.S. Navy bombing target 68. Figure 3.1-2 depicts OHV designations under the existing 1987 RAMP.

### **3.1.2.2 Recreation Area Management Plan**

The BLM prepared a RAMP in 1987 to provide direction regarding resolving issues that were being experienced at the dunes. The RAMP included use statistics for 1977, 1978, and 1985; projected visitation and densities for 1986 through 2000; descriptions of use areas, and identification of the major issues at the dunes.

Public workshops were held to identify and prioritize management issues, concerns, and problems. The 12 major issues categories identified at the workshops are listed below:

- Recreation opportunities
- Safety and emergency services
- Resource protection and enforcement
- Protection of Wilderness suitability
- Public contact and interpretation
- Facility development
- Operations and maintenance
- Concessions and vendors
- Acquisition of legal access and undeveloped state and private inholdings
- Compatibility of land uses
- Use fees
- Potential Desert Plan amendments

Ten of these issue categories were addressed by the 1987 RAMP. Two categories, Use fees and Potential Desert Plan amendments, were addressed in other forums. The 1987 RAMP included:

- A series of management objectives to be applied to the entire ISDRA
- Multiple-Use Class objectives
- Management constraints (the CDCA Plan, other activity plans, authorized uses other than recreation, and Wilderness interim management constraints)

The management program outlined in the 1987 RAMP included management prescriptions for the 10 major issue categories and prioritized them into four funding levels. The funding levels included Level 1 (reduced funding), Level 2 (maintain present management capability), Level 3 (modest improvements), and Level 4 (significant improvement in management capability) (BLM, 1987).

### **3.1.2.3 Recreation Opportunity Spectrum**

The BLM is committed to providing opportunities for visitors to obtain various types of outdoor recreational experiences and benefits dependent upon a combination of (1) the kind of activity desired, (2) the physical or locational setting, and (3) the level of experiences. The planning tool used to consider these opportunities is called the Recreational Opportunity Spectrum. The purposes of a ROS inventory are to:



- Identify, delineate, classify, and record areas into recreation opportunity classes based on their current state of remoteness, naturalness, and expected social experience
- Provide information regarding existing recreation opportunities to decisionmakers to assist them in making decisions on appropriate land uses, resource development objectives, and management prescriptions

The ROS identifies a variety of recreational experience opportunities categorized into six classes. A class is defined by the degree to which it satisfies certain recreational experience needs and is based on the extent to which the natural environment has been modified, the type of facilities provided, the degree of outdoor skills needed to enjoy the area, and the relative density of recreational use. The ROS classes are:

- Primitive (P)
- Semi-Primitive Non-Motorized (SPNM)
- Semi-Primitive Motorized (SPM)
- Roaded Natural (RN)
- Rural (R)
- Urban (U)

The ROS classes have been described previously in Chapter 2 of this DEIS.

The BLM has not performed a ROS inventory of the lands within the ISDRA, nor has it designated those lands a relative ROS classification.

The area available for overnight camping with large conveyances (e.g., trailers and motorhomes) is well defined and delineated to the visiting public. The acreage that is suitable for overnight camping is primarily along Gecko Road, eastern end of SR-78, northern portion of Ted Kipf Road, and the area adjacent to and south of I-8. The acreage available for overnight camping and the number of available camp sites is provided in Table 3.1-1.

### 3.1.3 Existing Recreation Resources

#### 3.1.3.1 Recreation Facilities

**Table 3.1-1 Acreage and Number of Camp Sites by Management Area and Camping Area**

AREA	ACREAGE AVAILABLE FOR CAMP SITES <sup>A</sup>	NUMBER OF AVAILABLE CAMP SITES
<b>Gecko Management Area</b>		
• Cement Flats	4	7
• Camping Pads 1-5	13	47
• Gecko Campground	41	74
• Keyhole Campground	0.5	1
• Roadrunner Campground	12	22
• Subtotal	70.5	151
<b>Buttercup Management Area</b>		
• Buttercup Campground	69	124
• Midway Campground	6	22
• Grays Well (dispersed area)	357	643
• Subtotal	432	789
<b>Mammoth Management Area</b>	1,000	1,800
<b>Glamis Management Area</b>	2,014	3,625



**Table 3.1-1 Acreage and Number of Camp Sites by Management Area and Camping Area**

AREA	ACREAGE AVAILABLE FOR CAMP SITES <sup>A</sup>	NUMBER OF AVAILABLE CAMP SITES
Adaptive Management Area	11,840	8
Ogilby Management Area	1,539	1 <sup>b</sup>
Dune Buggy Flats Management Area	1,800	1 <sup>b</sup>
North Algodones Dunes Management Area	27,089	19 <sup>b</sup>
<b>Total</b>	<b>45,784.5</b>	<b>6,394</b>

<sup>a</sup>Source: Haas, 2002.

<sup>b</sup>No motorized vehicles allowed at these camp sites.

These management areas and camping areas are depicted in Figures 3.1-3a and 3.1-3b.

The camping areas consist of open, undeveloped areas that provide dispersed camping opportunities. Paved roads provide access to the camping areas. Individual campsites are not delineated, but hard surfaces are provided in certain areas for vehicles to park. Visitors select their camping area on a first-come, first-served basis.

Pit toilet facilities and trash dumpsters are provided at the camping areas in the Gecko, Glamis, and Buttercup Management Areas.

Although socialization is a very important part of the experience, visitors want a degree of privacy and personal space around the overnight camping locations. Therefore, they will often encircle their vehicles (e.g., wagon train style) or use markers and flagging to delineate their desired area.

### 3.1.3.2 Recreation Visitation

The earliest known annual visitation at the ISDRA was 150,000 in the late 1970s; the number of visits had increased to 225,900 visits in 1985 (BLM, 1987). The average annual number of visits to the ISDRA over the 2-year period of 1999 to 2001 was over 750,000 (BLM, 2001q). Between October 1, 1999, and September 30, 2000, there were 867,753 visits to the ISDRA. This is shown by camping area in Table 3.1-2.

It is estimated that 10 percent of current visitation originates locally; 80 percent originates within a region bounded by San Diego, Los Angeles, Phoenix and Tucson; and 10 percent originates from other parts of the United States (Haas, 2002).

Ninety percent of the visitors to ISDRA are associated with OHV recreation. The remaining 10 percent are largely associated with non-motorized recreation in the North Algodones Dunes Wilderness (Haas, 2002).



Table 3.1-2 ISDRA Visits (1999-2000)<sup>a</sup>

SITE	VISITSB	VISIT (%)
Buttercup Campground	107,639	12.4
Dispersed – Imperial Dunes	571,319	65.8
Gecko Campground	107,639	12.4
Midway Camping Pad	16,231	1.9
Plank Road	16,231	1.9
Roadrunner Campground	48,694	5.6
<b>Total</b>	<b>867,753</b>	<b>100.0</b>

<sup>a</sup>The 1999-2000 year is defined as October 1, 1999, through September 30, 2000.

<sup>b</sup>A “Visit” occurs when one person visits BLM lands to engage in any recreational activity, whether for a few minutes, full day, or more.

Source: BLM, 2001q

Over 80 percent of the visitors to the ISDRA are repeat visitors (USFS, 1993). It is common for a camping party to consist of three or four generations of relatives who have been visiting the area over the years. This provides a sense of tradition, nostalgia, history, intergenerational bonding, and a sense of place attachment.

Typical visitation includes relatively large groups for overnight stays. It is common to see overnight groups with 3 to 6 recreation “sleeping” vehicles, accompanying trailers, 12 to 18 family members or friends, and multiple types of OHVs, staying for a 3-day weekend. Groups primarily camp in large recreation vehicles accompanied with many conveniences of home (e.g., chairs, tables, awnings, grills, firewood) (Haas, 2002).

The ISDRA is open to the public year-round. However, due to high temperatures throughout the dunes during the summer months, the recreation season is considered to be October 1 through Easter of each year. Because the date of Easter varies from year to year and “spring breaks” offered by the various schools also differ, the end of the recreation season for this analysis is considered to be April 15.

Visitation to ISDRA is unevenly distributed throughout the year. Fifty percent of the annual visitation occurs during approximately 11 percent of the recreation season (i.e., on 21 holiday days out of 197 days in the season). These holiday days are significant spikes in visitation. Table 3.1-3 shows the campsite occupancy rate for the ISDRA throughout the year.



**Table 3.1-3 Campsite Occupancy Rate for the ISDRA<sup>a</sup>**

TIME PERIOD	PERCENT OF DAYS DURING THE RECREATION SEASON <sup>b</sup>	OCCUPANCY RATE
Major holidays, weekends, and shoulder days	11	100+
Nonholiday weekends (Friday through Sunday)	38	30
Weekdays (Monday through Thursday)	51	10

<sup>a</sup>The recreation season is considered to be October 1 - April 15.

<sup>b</sup>The number of days in the recreation season is 197.

<sup>c</sup>The number of days included in "major holidays, weekends, and shoulder days" is 21.

As shown in Table 3.1-3, during 11 percent of the recreation season, i.e., the six major holidays, the camping areas exceed their capacity. Therefore, demand exceeds supply (capacity) during the six major holidays, affecting 50 percent of the visitors who come to the ISDRA in a year.

During 38 percent of the nonholiday weekends during the recreation season, the camping areas are 30 percent full. On weekdays during the recreation season, 51 percent of the time the camping areas are 10 percent full. This table also shows that, during 89 percent of the recreation season, the ISDRA camping areas are less than or equal to 30 percent full.

### 3.1.3.3 Visitor Capacity

For this analysis, visitor capacity is defined as the number of visitors that can be accommodated in an area. Table 3.1-4 shows the estimated visitor capacity by management area and camping area in the ISDRA.

**Table 3.1-4 Visitor Capacity by Management Area and Camping Area**

AREA	VISITOR CAPACITY <sup>A</sup>
<b>Gecko Management Area</b>	
• Cement Flats	151
• Camping Pads 1-5	984
• Gecko Campground	1,534
• Keyhole Campground	21
• Roadrunner Campground	462
Subtotal	3,172
<b>Buttercup Management Area</b>	
• Buttercup Campground	2,604
• Midway Campground	462
• Grays Well (dispersed area)	13,503
Subtotal	16,569
<b>Mammoth Management Area</b>	37,800
<b>Glamis Management Area</b>	76,125
<b>Adaptive Management Area</b>	28 <sup>b</sup>
<b>Ogilby Management Area</b>	4 <sup>b</sup>



**Table 3.1-4 Visitor Capacity by Management Area  
and Camping Area**

AREA	VISITOR CAPACITY <sup>A</sup>
<b>Dune Buggy Flats Management Area</b>	4 <sup>b</sup>
<b>North Algodones Dunes Management Area</b>	67 <sup>b</sup>
<b>Total</b>	<b>133,769</b>

<sup>a</sup>The visitor capacity presented is based on the acreage available for camping, the number of available campsites, an average number of vehicles per camping party, and an average number of people per vehicle.

<sup>b</sup>No motorized vehicles allowed at these camp sites.

The supply of recreation opportunities at the ISDRA exceeds the demand during 89 percent of the recreation season (October 1 to April 15); that is, there is adequate capacity for those visitors who visit the ISDRA any time other than the six major holiday weekends.

The exceedance of capacity on the holiday weekends results in a change in several important social and managerial attributes of the setting, which then leads to a change in the recreation opportunity being provided. There is a change from providing the intended Rural, Roaded Natural, and Semi-Primitive type recreation opportunity to an urban recreation opportunity.

The social attributes at ISDRA change on the six holiday weekends because many visitors frequent the ISDRA to engage in illegal activities (e.g., alcohol, drug use, speeding) and inappropriate behavior, which is inconsistent with the intended ISDRA recreation opportunity. Therefore, when capacity is being exceeded (on the six holiday weekends), the supply of OHV recreational opportunities that the ISDRA is intended to provide is not available.



## 3.2 BIOLOGICAL RESOURCES

### 3.2.1 Regulatory Framework

#### 3.2.1.1 Federal Endangered Species Act

The Federal Endangered Species Act (FESA) of 1973, as amended, provides the regulatory framework for the protection of threatened and endangered (T&E) plant and animal species formally listed under the FESA, as well as their designated critical habitat. The USFWS, in consultation with other federal agencies (see Section 3.2.2.), administers and enforces the FESA. The following terms are defined by the FESA:

Endangered: Any species that is in danger of extinction throughout all or a significant portion of its range.

Threatened: Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Proposed: Any species that has been proposed for listing as a threatened or endangered species.

Critical Habitat: "...the specific areas within the geographical area occupied by the species ... on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection..."

#### 3.2.1.2 California Endangered Species Protection

The California Endangered Species Act (CESA) of 1984 and the California Native Plant Protection Act (CNPPA) of 1977 provide the framework for protection of California listed T&E plant or animal species or rare plant species. Protection by the state is also offered to candidate species that have been accepted for state review for potential listing as endangered, threatened, or rare. The following terms are defined by the CESA:

- Endangered: A native species or subspecies of animal or plant that is endangered of becoming extinct throughout all, or a significant portion, or its range due to one or more causes, including loss of habitat, change of habitat, overexploitation, predation, competition, or disease.
- Threatened: A native species or subspecies of animal or plant that, although not currently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by Chapter 1.5 of the California Fish and Game Code.
- Rare: A species, subspecies, or variety of plant is rare when, although not currently threatened with extinction, it is in such small numbers throughout its range that it may become endangered if its present environment worsens.
- Candidate: A native species or subspecies of animal or plant that the California Fish and Game Commission (CFGF) has formally noticed as being under review by the CDFG for addition to either the endangered or



threatened species list, or a species for which the CFGC has published a notice of proposed regulation to add the species to either list.

- Species of Special Concern: Native species or subspecies of animal or plant that has become vulnerable to extinction because of declining population levels, limited ranges, or rarity. The goal is to prevent these species from becoming endangered by addressing the issues of concern early enough to secure long-term viability.

### 3.2.1.3 BLM Special-Status and Sensitive Species

The BLM recognizes a special-status species as an animal or plant that meets any one of the following criteria: (1) it is federally listed as endangered or threatened; (2) it is federally proposed as endangered or threatened; (3) it is a federal candidate for listing; (4) it is state listed as Rare, Threatened, or Endangered; or (5) it has been designated by the BLM State Director as a sensitive species. Additionally, all List 1B plants in the 6<sup>th</sup> edition of the California Native Plant Society (CNPS) Inventory that are on BLM lands, and do not meet any of the first four of the special-status species criteria, are considered sensitive species.

### 3.2.1.4 California Native Plant Society

The CNPS is a professional society of botanists, biologists, scientists, and other associated professionals who have accumulated a statewide database on California native plant abundance and distribution. The CNPS has developed four categories to describe the status of plants species as: rare, threatened, endangered, or extinct. Although these listings do not afford legal status or protection for the species, agencies consult the list in their planning process for activities that may potentially impact any of these species. The listing categories are as follows:

- CNPS 1A: Plant Species presumed to be extinct in California.
- CNPS 1B: Plant species presumed to be rare, threatened, or endangered in California and elsewhere.
- CNPS 2: Plant species presumed to be rare, threatened, or endangered in California but common elsewhere.
- CNPS 3: Plant species for which more information is needed to be properly categorized, and includes an assemblage of taxa that have been transferred from other lists or have been suggested to CNPS for consideration.
- CNPS 4: Plant species that are not currently threatened or vulnerable but are considered to have limited distribution in California and, because of their uncommon status, should be monitored.

### 3.2.1.5 California Natural Diversity Database

The California Natural Diversity Database (CNDDDB) is a computerized inventory of data on the general location and condition of California's rare, threatened, and endangered animals, plants, and natural communities that CDFG maintains. The database also maintains inventories of federally listed T&E species. The CNDDDB includes species that the scientific community



feels deserving of an official listing, species proposed for federal listing, U.S. Forest Service (USFS) special-status species, and state candidate species.

**3.2.1.6  
Migratory Bird  
Treaty Act**

The USFWS administers and enforces the Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 701-718h). Virtually all birds are protected under the MBTA, with four exceptions (California quail, English sparrows, common pigeons, and European starlings). The MBTA controls the taking of these birds, their nests, eggs, parts, or products without obtaining a permit from the USFWS.

**3.2.1.7 U.S.  
Fish and  
Wildlife Service  
Consultation  
and  
Conference**

Section 7 of the FESA mandates federal agencies that fund, authorize, or carry out actions that may affect listed species or adversely modify their critical habitat must consult with the USFWS. It is the responsibility of the action agency to determine if their actions may affect listed species. If the action agency makes a "may affect" determination, then that agency should initiate an informal consultation with the USFWS. During informal consultation, it will be determined if the action will adversely affect the species, in which case formal consultation will be initiated.

Formal consultation is not required if the USFWS concurs in writing that an action will not adversely affect the species. However, if it is determined that the action may adversely affect T&E species, formal consultation will be initiated. As part of the formal consultation process, the action agency prepares a biological assessment/evaluation that contains a description of the proposed action, map of the project area, potential effects to listed species or critical habitat, and any relevant reports.

Once completed, formal consultation results in a biological opinion issued from the USFWS to the action agency. The biological opinion will contain the following information: (1) an analysis of the direct, indirect, interrelated, interdependent, and cumulative effects; (2) a determination of whether the action is likely or not likely to jeopardize the continued existence of the species; (3) an incidental take statement for wildlife that will identify the anticipated level of take; (4) mandatory reasonable and prudent measures and the terms and conditions to minimize incidental take; and (5) discretionary conservation recommendations that would further minimize impacts and promote conservation of the species.

When a proposed action affects a species proposed for listing as threatened or endangered, a formal conference (as opposed to a consultation for a listed species) with the USFWS may be required. Unlike biological opinions, recommendations made in conference opinions are advisory and therefore nonbinding. The primary purpose of conferencing is to avoid delay of a proposed action should a species proposed for listing become listed, and to ensure that the proposed action does not jeopardize a species' recovery potential. Should a species become formally listed prior to implementation of the proposed action, a federal agency is required to informally consult with the USFWS regarding the conference opinion. In the absence of additional new information, USFWS may adopt the formal conference opinion as the



biological opinion without the federal agency having to initiate formal consultation.

The BLM is requesting formal consultation on the Threatened Peirson's milk-vetch (*Astragalus magdalenae* var. *peirsonii*) and desert tortoise (*Gopherus agassizii*). A formal conference is also being requested for the Proposed Threatened flat-tailed horned lizard (*Phrynosoma mcallii*).

### 3.2.1.8 BLM Policies and Plans

The goal of the California Desert Conservation Act (CDCA) Plan is to provide for the use of public lands and resources of the CDCA, including economic; educational; scientific; and recreational uses; as well as protection of environmental, cultural, and aesthetic values of the desert and its future productivity. Carrying forth the management principles from FLPMA, the Plan establishes MUCs for the lands involved and establishes a framework for managing the various resources within these classes. The four uses include: Class C (controlled), Class L (limited), Class M (moderate) and Class I (intensive).

The CDCA incorporates the ISDRA and therefore provides general management guidance for the area. The CDCA Plan decision rationale and summary of resource values for Planning Unit Number 103, which includes the Algodones Dunes Wildlife Habitat Area (WHA), delineated the management goals for protection of rare and endangered wildlife and vegetation; enhancement of wildlife values; and extensive monitoring, especially of potential impacts to these resources from vehicle use.

FLPMA defines an Area of Critical Environmental Concern (ACEC) as an area within public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values; fish and wildlife resources; other natural system processes; or to protect human life and safety from natural hazards (USDI, 1980). ACECs are managed for special use, but with special restrictions; and they do not preclude appropriate development if protection of sensitive values can be assumed.

The Plan Area (buffer zone) includes a portion of the East Mesa ACEC, located adjacent to the southwest corner of the ISDRA. This ACEC was established on September 2, 1988, to protect the flat-tailed horned lizard (*Phrynosoma mcallii*) and two rare plant species: Thurber's pilostyles (*Pilostyles thurberi*) and Salton milk-vetch (*Astragalus crotalariae*), as well as cultural resources associated with the Lake Cahuilla shoreline. No management plan has been written for this ACEC (BLM, 2001b).

### 3.2.2 Habitat Types

The biological resources of the Plan Area includes several dune habitats that support a variety of desert plant and wildlife species, including special-status and endemic species found only at the Imperial Sand Dunes. The primary habitat types associated with the dune system are: Creosote Bush Scrub, Microphyll Woodland, Psammophytic Scrub, and Canal-Influenced Vegetation (Westec, 1977; BLM, 1987). Each habitat type is depicted in Figure 3.2-1 and described in detail below. Table 3.2-1 lists the plant species



that are known or have the potential to occur in the ISDRA. Table 3.2-2 lists the wildlife species that are known or have the potential to occur in the ISDRA.

**Table 3.2-1 List of Plant Species That Are Known or Have the Potential to Occur in the ISDRA**

COMMON NAME	SCIENTIFIC NAME	STATUS
Algodones Dunes sunflower	<i>Helianthus niveus</i> ssp. <i>tephrodes</i>	SE/CNPS-1B
Arrow weed	<i>Pluchea sericea</i>	
Big galleta	<i>Hilaria rigida</i>	
Birdcage evening-primrose	<i>Oenothera deltoides</i>	
Borrego milk-vetch	<i>Astragalus lentiginosus</i> var. <i>borreganus</i>	CNPS-4
Brittlebush	<i>Encelia farinosa</i>	
Brown plume wirelettuce	<i>Stephanomeria pauciflora</i>	
Burrobush	<i>Ambrosia dumosa</i>	
Burrobrush	<i>Hymenoclea salsola</i>	
California ditaxis	<i>Ditaxis serrata</i> var. <i>california</i>	CNPS-3
California threeawn	<i>Aristida californica</i>	
Carrizo mallow	<i>Sphaeralcea orcuttii</i>	
Cattail	<i>Typha</i> spp.	
Common sandpaper plant	<i>Petlonyx thurberi</i>	
Common sunflower	<i>Helianthus annuus</i>	
Coulter's lyrepod	<i>Lyrocarpa coulteri</i> var. <i>palmeri</i>	CNPS-4
Creosote bush	<i>Larrea tridentata</i>	
Crown-of-thorns	<i>Koeberlina spinosa</i> ssp. <i>tenuispina</i>	CNPS-2
Desert buckwheat	<i>Eriogonum deserticola</i>	
Desert dicoria	<i>Dicoria canescens</i>	
Desert lily	<i>Hesperocallis undulata</i>	
Desert panicum	<i>Panicum urvilleanum</i>	
Desert starvine	<i>Brandegea bigelovii</i>	
Desert thron-apple	<i>Datura discolor</i>	
Desert unicorn plant	<i>Proboscidea altheafolia</i>	CNPS-4
Desert willow	<i>Chilopsis linearis</i>	
Dyebush	<i>Dalea emoryi</i>	
Fairy duster	<i>Calliandra eriophylla</i>	CNPS-2
False daisy	<i>Eclipta alba</i>	
Fennel-leaf pondweed	<i>Potamogeton pectinatus</i>	



**Table 3.2-1 List of Plant Species That Are Known or Have the Potential to Occur in the ISDRA**

COMMON NAME	SCIENTIFIC NAME	STATUS
Foxtail cactus	<i>Coryphantha alversonii</i>	CNPS-4
Giant reed	<i>Arundo donax</i>	
Giant Spanish needle	<i>Palafoxia arida</i> var. <i>gigantea</i>	BLM/CNPS-1B
Glandular ditaxis	<i>Ditaxis clariana</i>	CNPS-2
Hairy stickleaf	<i>Mentzelia hirsutissima</i>	CNPS-2
Harwood milk-vetch	<i>Astragalus insularis</i> var. <i>harwoodii</i>	CNPS-4
Honey mesquite	<i>Prosopis glandulosa</i>	
Horseweed	<i>Conyza canadensis</i>	
Ironwood	<i>Olneya tesota</i>	
Lineleaf white puff	<i>Oligomeris linifolia</i>	
Longleaf jointfir	<i>Ephedra trifurca</i>	
Mediterranean grass	<i>Schismus barbatus</i>	
Mormon tea	<i>Ephedra trifurca</i>	
Munz's cholla	<i>Opuntia munzii</i>	BLM/CNPS-1B
Orocopia sage	<i>Salvia greatei</i>	BLM/CNPS-1B
Palmer's crinklemat	<i>Coldenia palmeri</i>	
Palo verde	<i>Cercidium floridum</i>	
Peirson's milk-vetch	<i>Astragalus magdalenae</i> var. <i>peirsonii</i>	FT/SE/CNPS-1B
Plicate Coldenia	<i>Tiquilia plicata</i>	
Ribbed cryptantha	<i>Cryptantha costata</i>	CNPS-4
Rock nettle	<i>Eucnida rupestris</i>	CNPS-2
Rush milkweed	<i>Asclepias subulata</i>	
Sand food	<i>Pholisma sonorae</i>	BLM/CNPS-1B
Shortspike watermilfoil	<i>Myriophyllum exalbescens</i>	
Small-flowered tamarisk	<i>Tamarix parviflora</i>	
Smoke tree	<i>Psoralea spinosa</i>	
Spiny chloracantha	<i>Aster spinosus</i>	
Spotted cadythumb	<i>Polygonum fusiforme</i>	
Thurber's pilostyles	<i>Pilostyles thurberi</i>	CNPS-4
White ratany	<i>Krameria grayi</i>	
White sweetclover	<i>Melilotus albus</i>	
Wiggins' cholla	<i>Opuntia wigginsii</i>	CNPS-3
Wiggins' croton	<i>Croton wigginsii</i>	SR/CNPS-2



**Table 3.2-1 List of Plant Species That Are Known or Have the Potential to Occur in the ISDRA**

COMMON NAME	SCIENTIFIC NAME	STATUS
Winged cryptantha	<i>Cryptantha holoptera</i>	CNPS-4
Woolly desert marigold	<i>Baileya pleniradiata</i>	

## Legend:

FT: Federal threatened

SE: California state endangered

SR: California state rare

BLM: BLM Sensitive Species

CNPS: California Native Plant Society:

1B – Taxa determined to be rare, threatened, or endangered in California and elsewhere

2 – Species rare or endangered in California but common elsewhere

3 – More information on status needed

4 – Species of limited distribution

**Table 3.2-2 List of Wildlife Species That Are Known or Have the Potential to Occur in the ISDRA**

COMMON NAME	SCIENTIFIC NAME	STATUS
<b>Mammals</b>		
American badger	<i>Taxidea taxa</i>	
Antelope ground squirrel	<i>Ammospermophilus leucurus</i>	
Big brown bat	<i>Eptesicus fuscus</i>	
Black-tailed hare	<i>Lepus californicus</i>	
California leaf-nosed bat	<i>Macrotus californicus</i>	BLM
Cave myotis	<i>Myotis velifer</i>	BLM
Colorado River cotton rat	<i>Sigmodon arizonae plenus</i>	
Coyote	<i>Canis latrans</i>	
Desert cottontail rabbit	<i>Sylvilagus audubonii</i>	
Desert kangaroo rat	<i>Dipodomys deserti</i>	
Desert pallid bat	<i>Antrozous pallidus pallidus</i>	
Desert woodrat	<i>Neotoma lepida</i>	
Greater western mastiff bat	<i>Eumops perotis californicus</i>	
Kit fox	<i>Vulpes macrotis</i>	
Merriam's kangaroo rat	<i>Dipodomys merriami</i>	
Mule deer	<i>Odocoileus hemionus</i>	
Occult little brown bat	<i>Myotis lucifugus occultism</i>	
Raccoon	<i>Procyon lotor</i>	
Roundtail ground squirrel	<i>Spermophilus tereticaudus</i>	
Small-footed myotis	<i>Myotis ciliolabrum</i>	
Spotted bat	<i>Euderma maculatum</i>	BLM
Townsend's big-eared bat	<i>Plecotus townsendii</i>	BLM
Western pipistrel	<i>Pipistrellus hesperus</i>	



**Table 3.2-2 List of Wildlife Species That Are Known or Have the Potential to Occur in the ISDRA**

COMMON NAME	SCIENTIFIC NAME	STATUS
White-throated woodrat	<i>Neotoma albigula venusta</i>	
Wild burro	<i>Equus asinus</i>	
Yuma hispid cotton rat	<i>Sigmodon hispidus eremicus</i>	
Yuma myotis	<i>Myotis yumanensis</i>	
Yuma mountain lion	<i>Felis concolor browni</i>	
<b>Birds</b>		
American Coots	<i>Fulica americana</i>	
American Kestrel	<i>Falco sparverius</i>	
Arizona Bell's Vireo	<i>Vireo bellii arizonae</i>	SE
Barn Owl	<i>Tyto alba</i>	
Black Tern	<i>Coalitionist niger</i>	
Black-tailed Gnatcatcher	<i>Poliophtila melanura</i>	
Black-throated Sparrow	<i>Amphispiza bilineata</i>	
Burrowing Owl	<i>Athene cunicularia</i>	BLM
Cactus Wren	<i>Campylorhynchus burnnecapillus</i>	
Cliff Swallow	<i>Hirundo pyrrhonota</i>	
Common Yellowthroats	<i>Geothlypis trichas</i>	
Crissal Thrasher	<i>Toxostoma dorsale</i>	
Ferruginous Hawk	<i>Buteo regalis</i>	
Gambel's Quail	<i>Lophortyx gambelli</i>	
Gila Woodpecker	<i>Melanerpes uropygialis</i>	SE
Gilded Northern Flicker	<i>Colaptes auratus chrysoides</i>	
Golden Eagle	<i>Aquila chrysaetos</i>	
Great Horned Owl	<i>Bubo virginianus</i>	
House Finch	<i>Carpodacus mexicanus</i>	
Ladder-backed Woodpecker	<i>Picoides scalaris</i>	
LeConte's Thrasher	<i>Toxostoma lecontei</i>	BLM
Lesser Nighthawk	<i>Chordeiles acutipennis</i>	
Loggerhead Shrike	<i>Lanius ludovicianus</i>	
Long-eared Owl	<i>Asio otus</i>	
Marsh Wren	<i>Cistothorus palustris</i>	
Merlin	<i>Falco columbarius</i>	
Mountain Plover	<i>Charadrius montanus</i>	
Mourning Dove	<i>Zenaida macroura</i>	
Northern Harrier	<i>Circus cyaneus</i>	
Peregrine Falcon	<i>Falco peregrinus</i>	SE
Prairie Falcon	<i>Falco mexicanus</i>	



**Table 3.2-2 List of Wildlife Species That Are Known or Have the Potential to Occur in the ISDRA**

COMMON NAME	SCIENTIFIC NAME	STATUS
Red-tailed Hawk	<i>Buteo jamaicensis</i>	
Red-wing Blackbird	<i>Agelaius phoeniceus</i>	
Say's Phoebe	<i>Sayornis saya</i>	
Sharp-shinned Hawk	<i>Accipiter striatus</i>	
Southwestern Willow Flycatcher	<i>Empidonax trailii extimus</i>	FE/SE
Turkey Vulture	<i>Cathartes aura</i>	
Vaux's Swift	<i>Chaetura vauxi</i>	
Verdin	<i>Auriparus subulata</i>	
Warbling Vireo	<i>Vireo gilvus</i>	
Western Flycatcher	<i>Empidonax difficilis</i>	
Western Least Bittern	<i>Lxobrychus exilis hasperus</i>	
Western Screech Owl	<i>Otus kennicottii</i>	
Western Yellow Billed Cuckoo	<i>Coccyzus americanus occidentalis</i>	SE
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	
White-faced Ibis	<i>Plegadis chichi</i>	
Wilson's Warbler	<i>Wilsonia pusilla</i>	
Yellow-headed Blackbird	<i>Xanthocephalus xanthocephalus</i>	
Yellow-rumped Warbler	<i>Dendroica coronata</i>	
<b>Insects</b>		
Andrews' dune scarab beetle	<i>Psuedocotalapa andrewsi</i>	
Brow-tassel weevil	<i>Trigonoscute brunnotasselata</i>	
Carlson's dune beetle	<i>Anomala carlsoni</i>	
Cheeseweed owlfly	<i>Oliarves clara</i>	
Hardy's dune beetle	<i>Anomala hardyorum</i>	
<b>Amphibians</b>		
Arizona southwestern toad	<i>Bufo microscaphus microscaphus</i>	
Couch's spadefoot toad	<i>Scaphiopus couchi</i>	BLM
San Sebastian leopard frog	<i>Rana yavapaiensis</i>	BLM
<b>Reptiles</b>		
Chuckwalla	<i>Sauromalus obesus</i>	
Colorado Desert fringe-toed lizard	<i>Uma notata</i>	BLM
Desert iguana	<i>Dipsosaurus dorsalis</i>	
Desert tortoise	<i>Gopherus agassizii</i>	FT/ST
Flat-tailed horned lizard	<i>Phrynosoma mcallii</i>	FPT
Rosy boa	<i>Lichanura trivirgata</i>	
Side-blotched lizard	<i>Uta stansburiana</i>	



**Table 3.2-2 List of Wildlife Species That Are Known or Have the Potential to Occur in the ISDRA**

COMMON NAME	SCIENTIFIC NAME	STATUS
Sidewinder rattlesnake	<i>Crotalus cerastes</i>	
Western whiptail lizard	<i>Cnemidophorus tigris</i>	
Zebra-tailed lizard	<i>Callisaurus draconoides</i>	

**Legend:**

- FE: Federal listed as endangered
- FT: Federal listed as threatened
- FPT: Federal proposed as threatened
- SE: California state listed as endangered
- ST: California state listed as threatened
- BLM: BLM Sensitive Species

### 3.2.2.1 Creosote Bush Scrub

Creosote bush scrub is the most common habitat type in the Colorado Desert and typically occurs on well-drained secondary soils of slopes, fans, and valleys. Within the ISDRA, this habitat type occurs on the relatively stable soils along the periphery of the dune system. It rarely occurs in the central portion of the ISDRA where shifting dunes are prevalent. This habitat type is generally characterized by relatively barren ground between widely spaced shrubs. To the west of the ISDRA, the habitat consists of almost pure stands of creosote bush. On the eastern boundary of the ISDRA, the vegetation is more diverse due to the topographic relief of the dunes and runoff from the nearby Chocolate and Cargo Muchacho Mountains. The creosote bush scrub within the alluvial fan between the desert washes forms a transitional zone with the microphyll woodland habitat type. This habitat type covers approximately 51,825 acres of the Plan Area, or 23 percent. Characteristic plant species of this habitat type include creosote bush (*Larrea tridentata*), brittlebush (*Encelia farinosa*), and burrobush (*Ambrosia dumosa*). Less abundant species associated with this habitat type include woolly desert marigold (*Baileya pleniradiata*), birdcage evening-primrose (*Oenothera deltoides*), dyebush (*Dalea emoryi*), longleaf jointfir (*Ephedra trifurca*), desert thorn-apple (*Datura discolor*), big galleta (*Hilaria rigida*), white rhatany (*Krameria grayi*), and brown plume wirelettuce (*Stephanomeria pauciflora*).

The wildlife commonly associated with this creosote bush scrub include desert iguana (*Dipsosaurus dorsalis*), zebra-tailed lizard (*Callisaurus draconoides*), western whiptail lizard (*Cnemidophorus tigris*), Red-tailed Hawk (*Buteo jamaicensis*), Mourning Dove (*Zenaida macroura*), Lesser Nighthawk (*Chordeiles acutipennis*), Black-tailed Gnatcatcher (*Poliophtila melanura*), Yellow-rumped Warbler (*Dendroica coronata*), White-crowned Sparrow (*Zonotrichia leucophrys*), big brown bat (*Eptesicus fuscus*), kit fox (*Vulpes macrotis*), roundtail ground squirrel (*Spermophilus tereticaudus*), and black-tailed hare (*Lepus californicus*). Special-status or sensitive wildlife species that may occur in this habitat include desert tortoise, flat-tailed horned lizard, Western Burrowing Owl (*Athene cunicularia*), and LeConte's Thrasher (*Toxostoma lecontei*). The endemic Hardy's dune beetle (*Anomala*



*hardyorum*) and Carlson's dune beetle (*Anomala carlsoni*) are also found in this habitat type (Hardy and Andrews, 1979).

### 3.2.2.2 Psammophytic Scrub

Psammophytic scrub occurs within the interior dune system where active and partially stabilized dunes are found. This habitat type occurs most frequently between active dunes in depressions that are commonly termed "bowls." The soils in these areas consist primarily of fine sand. As the dunes shift from year to year, the bowls generally shift as well. Vegetation is adapted to relatively high sand mobility and deep water percolation. Most of these plant species are capable of rapid growth given favorable soil moisture conditions. This habitat type covers approximately 108,658 acres of the Plan Area, or 48 percent. Common vegetation of this habitat type include Mormon tea (*Ephedra nevadensis*), desert buckwheat (*Eriogonum deserticola*), desert dicoria (*Dicoria canescens*), common sandpaper plant (*Petalonyx thurberi*), desert panicum (*Panicum urvilleanum*), and plicate coldenia (*Tiquilia plicata*). Additionally, birdcage evening primrose and desert lily (*Hesperocallis undulata*) may occur in the relatively stable dunes that form a transitional zone with the creosote bush scrub habitat.

The wildlife commonly associated with psammophytic scrub include Black-tailed Gnatcatcher, Mourning Dove, Cliff Swallow (*Hirundo pyrrhonota*), coyote (*Canis latrans*), roundtail ground squirrel, desert kangaroo rat (*Dipodomys deserti*), and black-tailed hare. The Colorado desert fringe-toed lizard (*Uma notata*) is the only sensitive wildlife species known to almost exclusively inhabit this area. The endemic Andrew's dune scarab beetle (*Psuedocotalapa andrewsi*) is also found in this habitat type (Hardy and Andrews, 1979).

### 3.2.2.3 Microphyll Woodland

To the east of the dune system is a large alluvial fan draining the Chocolate and Cargo Muchacho mountains. The alluvial fan is dissected by numerous ephemeral washes and separated by expansive, level interfluvies. The desert microphyll woodland typically is best developed in the larger drainages where dense stands of a variety of trees occur. Microphyll woodland is generally found along the margins of these dry channels, and around the cul-de-sac sinks of their termini. This habitat type covers approximately 65,382 acres of the Plan Area, or 29 percent. Vegetation is generally sparse in the open wash areas between the sinks. Typical vegetation of this habitat type include palo verde (*Cercidium floridum*), ironwood (*Olneya tesota*), smoke tree (*Psoralea spinosa*), and to a lesser degree honey mesquite (*Prosopis glandulosa*), desert willow (*Chilopsis linearis*), and desert unicorn plant (*Proboscidea altheaefolia*). Depending upon rainfall, the understory in the plains is generally composed of shrubs and annuals such as desert starvine (*Brandegea bigelovii*), carrizo mallow (*Sphaeralcea orcuttii*), California threeawn, Mediterranean grass (*Schismus barbatus*), lineleaf white puff (*Oligomeris linifolia*), and rush milkweed (*Asclepias subulata*).

The plant diversity and density combined with the micro-topographic variability associated with the washes, accounts for a high diversity of wildlife in the microphyll woodlands. The wildlife commonly associated with this



habitat type include side blotched lizard (*Uta stansburiana*), western whiptail lizard, zebra-tailed lizard, sidewinder rattlesnake (*Crotalus cerastes*), Red-tailed Hawk, Gambel's Quail (*Lophortyx gambelli*), Mourning Dove, Ladder-backed Woodpecker (*Picoides scalaris*), Verdin (*Auriparus flaviceps*), Western Flycatcher (*Empidonax difficilis*), Cactus Wren (*Campylorhynchus burnneicapillus*), Warbling Vireo (*Vireo gilvus*), Wilson's Warbler (*Wilsonia pusilla*), House Finch (*Carpodacus mexicanus*), Black-tailed Gnatcatcher, White-crowned Sparrow (*Zonotrichia leucophrys*), western pipistrelle bat (*Pipistrellus hesperus*), coyote, kit fox, mule deer (*Odocoileus hemionus*), white-tailed antelope squirrel (*Ammospermophilus leucurus*), black-tailed hare, and desert cottontail (*Sylvilagus audubonii*). Special-status or sensitive wildlife species that may occur in this habitat include desert tortoise, Couch's spadefoot toad (*Scaphiopus couchi*), Gila Woodpecker (*Melanerpes uropygialis*), Western Burrowing Owl, and LeConte's Thrasher.

The wildlife guzzlers installed by the CDFG to partially mitigate impacts from the construction of the New Coachella Canal has created limited herbaceous weedy vegetation within the microphyll woodland. The presence of water and forage around the guzzlers has attracted mule deer from the Chocolate Mountain range. Mule deer are known to use the microphyll woodlands associated with washes as corridors through the Algodones Dunes Wilderness Area and into the southern part of Mammoth Wash area. It is thought that the Yuma puma (*Felis concolor browni*) has followed the deer into the woodland to prey the mule deer.

#### 3.2.2.4 Canal-Influenced Vegetation

Both the Coachella and All American Canals support hydrophytic vegetation that is subject to periodic eradication efforts. Although the canals are lined, some seepage occurs and promotes the growth of hydrophytic vegetation. Submergent species include shortspike watermilfoil (*Myriophyllum exallescens*) and fennel-leaf pondweed (*Potamogeton pectinatus*). Emergent and upland species include cattails (*Typha* spp.), spotted cadythumb (*Polygonum fusiforme*) horseweed (*Conyza canadensis*), spiny chloracantha (*Aster spinosus*), giant reed (*Arundo donax*), small-flowered tamarisk (*Tamarix parviflora*), false daisy (*Eclipta alba*), common sunflower (*Helianthus annuus*), white sweetclover (*Melilotus albus*), and arrow weed (*Pluchea sericea*).

This manmade habitat is utilized by a variety of birds including American Coot (*Fulica americana*), Red-wing Blackbird (*Agelaius phoeniceus*), Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*), Common Yellowthroat (*Geothlypis trichas*), and Marsh Wren (*Cistothorus palustris*). Common mammals of this habitat include black-tailed hare, coyote, raccoon (*Procyon lotor*), and American badger (*Taxidea taxus*).

#### 3.2.3 Special-Status Plant Species

The designation of special-status includes federal- and state-listed species under either the federal or CESA, species proposed for federal listing, federal candidate species, and species designated as sensitive by the California State Director of the BLM (these include all plants on List 1B of the most recent CNPS Inventory of Rare and Endangered Plants of California). The following



special-status plant species are known to occur within the Plan Area. Therefore, these species may be affected by activity in the Plan Area. Descriptions of these species are provided below.

**3.2.3.1  
Peirson's Milk-  
Vetch  
(*Astragalus  
magdalenae*  
var. *peirsonii*)**

**Status**

Peirson's milk-vetch was proposed as endangered in 1992 and listed as threatened in 1998 (Federal Register, 1998). It is also recognized as endangered by the State of California and as a special-status species by the BLM. The CNPS lists the milk-vetch as a category 1B (rare, threatened, or endangered in California and elsewhere throughout its range) (Tibor, 2001). Critical habitat has not been designated for this species nor has a recovery plan been prepared.

**Life History**

Peirson's milk-vetch is a short-lived perennial reaching 8 to 30 inches high. The stems and leaves are pubescent, and the leaves are 2 to 6 inches long. The flowers are dull purple and are arranged in 10 to 17 flowered racemes. The resulting seed pods are 0.8 to 1.5 inches long and are inflated with a triangular beak (Bowers, 1996). This species is able to become reproductive in a single season. It generally completes seed production by June. By July, the plant has dropped many of its leaflets and some entire leaves. This condition may persist from July to October. Seedlings may be present in December, although not in great numbers. Seedlings that germinate by November or December may reach the flowering or fruiting stage by March (Romsper and Burk, 1979).

Seeds of the Peirson's milk-vetch are the largest of any North American milk-vetch species (Barneby, 1964). Within this genus, the large seeds are thought to be better adapted to active dunes than small seeds. This may be due to the larger food reserves enabling them to emerge even when deeply buried (Bowers, 1996). Harper et al. (1970), however, noted that there is a trade-off between seed size and seed numbers such that large-seeded plants typically produce fewer seeds. Peirson's milk-vetch seeds are transported within inflated pods that are dispersed by winds across the dunes where they may come to rest within vegetation or depressions. Many seeds fall prey to members of the seed beetle family, Bruchidae. This contributes to a high mortality of seeds and reduced seed crop for this species (Romsper and Burk, 1979).

Peirson's milk-vetch habitat consists of sandy depressions at the base of high dunes and lower established dunes. This species does not extend many lateral roots and, therefore, is more vulnerable if the main stem is broken. The vulnerability of the adult plants in conjunction with the period of seedling establishment during the cooler months, which coincides with the higher usage of the dunes by OHVs, makes this species sensitive to impacts (Romsper and Burk, 1979).

**Distribution and Occurrence within the Plan Area**

Peirson's milk-vetch, an obligate psammophyte, grows on the slopes and hollows of windblown dunes in the Colorado and Sonoran deserts. According



to Barneby (1964) and Wiggins (1980), it is known from the Imperial Sand Dunes. Additionally, the milk-vetch is known to occur in the Gran Desierto in Sonora, Mexico (Felger, 2000). Although it has been reported from Borrego Valley, San Diego County, California, it has not been observed there for several decades (Tibor, 2001).

The only location where the Peirson's milk-vetch is currently known to occur within the United States is the Imperial Sand Dunes, which supports between 75 and 80 percent of all of the world's known colonies of the species (Federal Register, 1998). The milk-vetch is associated with psammophytic scrub habitat within these dunes. The plant is generally scattered throughout the dune complex with a higher abundance of the plant along the central and western aspect of the Imperial Sand Dunes. Figure 3.2-2 depicts the distribution and abundance of this species at the ISDRA.

### Threats

OHV use and associated recreational development have been described as the primary threat to Peirson's milk-vetch through destruction of individual plants and habitat (Luckenbach and Bury, 1983; ECOS, 1990; Federal Register, 1998).

### Status

The Algodones Dunes sunflower was listed as endangered by the State of California in November 1979. It is recognized by the CNPS as 1B (rare, threatened, or endangered in California and elsewhere throughout their range).

### Life History

The Algodones Dunes sunflower (also commonly referred to as the Algodones sunflower and the silver-leaved dune sunflower) is a perennial herb and native to California. A dense covering of fine hairs protects the plant from excess light and heat, (a common dune plant adaptation), and gives the leaves a silvery appearance (BLM, 1987). The Algodones Dunes sunflower is a relatively long-lived species; and, once established, it is able to survive periods of below-average precipitation. Felger (2000) reports that the species is 1.5 to over 3 feet tall, occasionally to 9 feet. Like Peirson's milk-vetch, Algodones Dunes sunflower has relatively large seeds and is fast growing.

### Distribution and Occurrence within the Plan Area

The Algodones Dunes sunflower tends to grow in areas with active sand movement, such as on the lower portion of dune slip faces. The Algodones Dunes sunflower has been observed thriving where no other vegetation occurs on actively moving sand; but it also can be frequently associated with swales where concentrations of other vegetation are found (TOA, 2001).

Figure 3.2-3 depicts the distribution and abundance of this species at the ISDRA.

### Threats

At the ISDRA, the primary threat to Algodones Dunes sunflower is destruction of individual plants and habitat by OHV use and associated recreational development.

#### 3.2.3.2 Algodones Dunes Sunflower (*Helianthus niveus* ssp. *tephrodes*)



**3.2.3.3  
Wiggins'  
Croton (*Croton  
wigginsii*)**

**Status**

Wiggins' croton was recognized by the State of California as rare in January 1982 (CNDDDB, 2001). It is also recognized by the CNPS as Category 2 (plants rare, threatened, or endangered in California, but common elsewhere in their range).

**Life History**

Wiggins' croton is a many branched, woody perennial which grows from 20 to 30 inches high.

**Distribution and Occurrence within the Plan Area**

This species is native to California, Arizona, and from Baja California and Sonora, Mexico. In the Imperial Sand Dunes it is found within psammophytic scrub habitat and prefers stabilized and partially stabilized desert dune systems (CNDDDB, 2001). It most often grows on south or southeast slopes of basins, and sometimes grows farther toward the floor of the basin (TOA, 2001). Figure 3.2-4 depicts the distribution and abundance of this species at the ISDRA.

**Threats**

At the Plan Area, the primary threat to Wiggins' croton is destruction of individual plants and habitat by OHV use and associated recreational development.

**3.2.3.4 Giant  
Spanish Needle  
(*Palafoxia arida  
var. gigantea*)**

**Status**

The giant Spanish needle is recognized by the BLM as a sensitive species. The CNPS lists the giant Spanish needle as Category 1B (rare, threatened, or endangered in California and elsewhere throughout their range).

**Life History**

Giant Spanish needle is a fast-growing annual found on active sand dunes. This dune species tends towards gigantism, with larger and more robust plants than related nondune taxa (Felger, 2000). Felger (2000) reports it growing from 2 to 5 feet tall.

**Distribution and Occurrence within the Plan Area**

This species is native to California and is found from California to Arizona and in Sonora, Mexico (BLM, 1987; TOA, 2001). Once established, giant Spanish needle is able to survive periods of below-average precipitation. Abundance of giant Spanish needle in a given year is almost unrelated to the precipitation of the immediately preceding growing season (BLM, 2001a). As a short-lived flowering perennial, it frequently occurs within the Imperial Sand Dunes in sites with milk-vetch and croton (BLM, 2001a; TOA, 2001). Most of its occurrences were south of the large enclosure south of I-8 (TOA, 2001). Figure 3.2-5 depicts the distribution and abundance of this species at the ISDRA.



### Threats

At the Plan Area, the primary threat to Algodones Dunes sunflower is destruction of individual plants and habitat by OHV use and associated recreational development.

#### 3.2.3.5 Sand Food (*Pholisma sonora*)

### Status

This species is recognized by the BLM as a sensitive species. The CNPS lists this species as Category 1B (rare, threatened, or endangered in California and elsewhere throughout their range).

### Life History

This parasitic, perennial herb is native to California. As a root parasite, most of the plant is buried in the sand and only the flower heads are visible aboveground. This species is parasitic on *Tiquilia plicata* and *Eriogonum deserticola* (Armstrong, 1980) and possibly also on *Croton wigginsii* (Westec, 1977). The point of connection with the host plant may be more than a yard below the surface. Sand food stems are succulent and store copious amounts of water. During times of drought, it may provide moisture to the host plant. It is visible aboveground for only a short time. Each spring, a flowering stem is sent to the surface by the sand food, which produces a disk-shaped inflorescence with hundreds of tiny pink flowers. Sand deflation does not seem to affect its flowering (TOA, 2001).

### Distribution and Occurrence within the Plan Area

The primary habitat of sand food is open, sandy flats and sandy or stony desert washes within creosote bush scrub (CNDDDB, 2001). Sand food was found at scattered locations during the TOA survey, most commonly in the Gecko Road area and the area just south of the large interim closure. It was generally in somewhat flat areas, but its appearance was difficult to predict, as there were many sites with hosts but without sand food (TOA, 2001). Figure 3.2-6 depicts the distribution and abundance of this species at the ISDRA.

### Threats

At the Plan Area, the primary threat to sand food is destruction of individual plants and habitat by OHV use and associated recreational development. Additionally, impacts to host plants would have a negative effect on the sand food population (BLM, 2001a).

#### 3.2.3.6 Relevant Reports

### BLM Monitoring Report

In 1998, the BLM initiated monitoring of the six rare plant species. Monitoring was conducted in spring and summer 1998, spring 1999, spring 2000, and spring 2001. Results of the spring 2001 survey are not currently available. Utilizing the Westec study methodology (discussed later in this section), the dunes were divided into four geographic strata, 34 of the original 66 transects were randomly selected from those strata and divided into cells. Numbers of rare plants were then recorded within 10 to 15 meters or fixed parallel transects in each of the cells. Abundance classes were assigned for each species in a cell (BLM, 2000a). This report compared the responses of



the six rare plant species, as measured by abundance class data, over all 4 years of monitoring (1977 and 1998-2000). The study concluded that plants are at least as abundant and widespread in the entire dune system as they were in 1977. This report also noted that healthy populations of all six species remain in areas open to recreation, although the aboveground expression of populations of some of these species dramatically fluctuates with precipitation (BLM, 2001a).

The following is a species-by-species summary of the BLM monitoring study:

**Peirson's milk-vetch.** Abundance was closely tied to precipitation throughout the four years of monitoring. Species abundance was highest in 1998, second highest in 1977, third highest in 1999, and lowest in 2000. This mirrors the ranking of the four growing seasons in terms of average precipitation. Recruitment was possibly high in 1998 and low to nonexistent in 1999 and 2000. Responses of this species were similar in both the closed and open recreation areas across all 4 years of monitoring.

**Algodones Dunes sunflower.** Abundance increased significantly between 1977 and 1998. This increase is the result of a large increase in the values for the open area between 1977 and 1998. There were only slight decreases in abundance for 1999 and 2000. Between 1977 and 1998, the species declined in abundance in the closed area. This could be the result of lower recruitment of individuals into the population in the closed area. With the exception of 1977, the responses in the open and closed areas were parallel.

**Wiggins' croton.** Abundance in 1977 was about half of 1998. Abundance for 1999 and 2000 was similar to 1998. This increase may represent a real increase in the population size of this species in the dune system. Most of this increase was detected in the open area. Comparison of abundance in the closed and open areas indicate that except for 1977, when abundance was similar for both areas, the abundance for the rest of the years showed that open areas consistently had higher abundance.

**Giant Spanish needle.** Abundance was highest in 1998, the best rainfall year. However, abundance was second highest in 2000, the lowest rainfall season. The reason for the relatively high abundance in 2000 was unclear. Based on rainfall, it was expected that 1977 would have the second highest abundance. Instead, 1977 abundance ranked third and 1999 ranked last. The abundance between closed and open areas is very similar for 1977, 1998, and 1999, with 2000 having more abundance in the closed area. Data also appear to indicate that this species is more common in the northern part of the dunes, independent of whether the area is closed or open.

**Sand food.** Abundance increased between 1977 and 2000, with the highest abundance registered for 2000, the worst rainfall year. The reason for the relatively high abundance in 2000 was unclear. The second highest abundance was 1998, and 1999 abundance was very close to 1998. Abundance for this species in closed and open areas was the same for 1999. In 1998 and 2000, the values for the closed areas were higher than open areas. However, this



determination may have been due to a limitation in the survey method. In 1998, 1999, and 2000, transects were conducted on foot in the closed area, while those in the open area were run from a dune buggy. Additionally, in 1977, closed areas had lower abundance than open. This, too, may have been due to a limitation in the survey method. The 1977 survey utilized a helicopter in closed areas, not the ideal survey method to detect this cryptic plant.

**Borrego milk-vetch.** Abundance was essentially the same in 1977 and 1998. No plants at all were found in either 1999 or 2000, a statistically significant decline from 1998 and 1977 levels. Presumably, precipitation was insufficient for growth and establishment in 1999 and 2000. No comparison of abundance between closed and open areas was made because this taxon did not occur in the closed area.

### **Thomas Olsen and Associates Report**

In 2001, the American Sand Association (ASA) retained the services of Thomas Olsen and Associates (TOA) to provide an independent assessment of the abundance, distribution, and life history of the Peirson's milk-vetch at the Imperial Sand Dunes. Additional distribution and abundance data were also collected on five other rare plants. As opposed to the BLM monitoring study, this study was designed to obtain an actual census of Peirson's milk-vetch. The other five plant species were also counted when they were observed with Peirson's milk-vetch. A nonprobabilistic survey was employed to determine areas for survey. As a first step in the survey methodology interviews of OHV users, BLM staff, and Border patrol officers who were familiar with the project area were conducted to determine locations of Peirson's milk-vetch. The second step included a general reconnaissance of the entire dune areas outside the interim closures and wilderness area. The third step consisted of actual intensive surveys of specific areas based on professional knowledge of habitat requirements of species, reconnaissance information, and feedback from the interviewees (TOA, 2001).

The team surveyed by foot and rail within the open areas. When a substantial number of plants was detected, the area was designated as a "site." A number was assigned to each site, and a team of two to three biologists conducted a census of the plants and recorded other habitat characteristics. Areas that were too small to circumscribe on a map or contained a small number of plants were designated as "points." Additionally, the team conducted an aerial survey by helicopter of the interim closure areas. Parallel transects or concentric circles of decreasing diameter were flown within each of the closure area boundaries south of SR-78 and a portion of the Algodones Dunes Wilderness Area north of the highway.

The survey produced a total of 61 sites and 66 points containing one or more of the rare plants within the dunes. Notable concentrations were found in several areas, which included: (1) the southern portion of the dunes near the international border and west of Buttercup Valley; (2) the area near Patton Valley, south of the large closure and west of the dune peaks; (3) between the



small central closure and the large central closure; and (4) the east side of the small central closure.

The general conclusion from this study was that the distribution of the rare plants is dependent on the geomorphology of the dunes, and they tend to be concentrated in areas where there is relative substrate stability. These are areas located generally on the lee side of the large dunes, in areas where the surface gradually slopes upwards from deep or shallow basins at the base of steep slipfaces. The study also concluded that less than 1 percent of the plants had been affected by OHVs (TOA, 2001).

The following is a species-by-species summary of the TOA study:

**Peirson's milk-vetch.** A grand total of 71,926 individual plants was recorded. Occurrences were clustered in general areas, and no milk-vetch were detected in large portions of dunes. Generally, they were found west of the primary dunes in the open areas. The greatest number of plants found at a single site was 3,994 in the southern border area.

**Algodones Dunes sunflower.** This species was detected in 31 of 61 Peirson's milk-vetch sites, for a total count of 1,289, scattered throughout the primary dunes. The greatest estimated number of plants at a single site was 431 individuals.

**Wiggins' croton.** This species was found at 52 of 61 Peirson's milk-vetch sites for a total count of 3,614. They were found evenly distributed throughout the open areas, sharing generally the same habitat as the milk-vetch.

**Giant Spanish needle.** This species was found at 47 of 61 Peirson's milk-vetch sites for a total count of 4,191 individuals. Most of the occurrences were south of the Central Closure #2 and south of I-8.

**Sand food.** A total of 65 plants was found at nine scattered sites and points, most notably in the Gecko Road area and the area just south of Central Closure #2.

**Borrego milk-vetch.** The preferred habitat at the Plan Area for the Borrego milk-vetch, which is on the eastern portion of the dune system, was generally not surveyed during this study. However, a single site with 15 individuals was detected on the eastern edge of the dunes.

### **Westec Services, Inc. Report**

The initial survey of rare plants in the Imperial Sand Dunes was carried out by Westec Services, Inc., under contract with the BLM in 1977. They surveyed for eight rare plants, of which seven were found. To determine species abundance, Westec surveyed 66 west-east, randomly selected parallel transects that were segmented into cells 0.45-mile per side (Westec, 1977). It must be noted that the Westec study was not specifically designed to study OHV impacts, and the conclusions are based on a single-year study. The study offered the following conclusions:



- Seedlings of rare species could not be found in “high impact areas,” while seedlings of these species were abundant in other areas of the dunes.
- Intensity of OHV use in the dunes appears to be the key factor in impacting dune vegetation. Greatest impact occurs within the heaviest use areas.
- Lower level of “secondary impact” occurs throughout the dunes. However, this sporadic impact appears to decrease with increasing distance from the center of high impact areas.
- Despite the observed impacts, healthy reproducing populations of all rare plant species occurred within the dunes.

### **Luckenbach and Bury Report**

In 1983, the Luckenbach and Bury study conducted at the Imperial Sand Dunes is perhaps one of the most significant studies that systematically addressed OHV impacts to the dune biota. However, the study has limited utility toward drawing conclusions with respect to rare plants since most of the study plots had none of these species in them. Another limitation is that the study compared sites with heavy OHV use to sites with no OHV use, which does not allow inferences to be made to less heavily used OHV sites. Also, what data were collected showed that Peirson’s milk-vetch density and cover were actually higher in the OHV area than in the closed, control area. The following are the conclusions of this study:

- OHV activities in the dunes are highly detrimental to dune biota.
- Both herbaceous and shrubby perennial vegetation is reduced greatly in areas where OHVs operate.
- Most commonly, plants were destroyed by direct destruction or damage to root systems of psammophytic shrubs.
- Changes due to OHV impacts may result in substrate changes, such as compaction, reduced porosity, altered thermal structure, and reduced moisture content, although these effects were not tested.

### **ECOS, Inc. Report**

In 1990, Ecos, Inc. was contracted by BLM to perform habitat characterization and rare plant species analysis as well as design a long-term monitoring plan. This study did not count the total number of plants; instead, they analyzed population fitness by scoring a set of variables for each species. This study concluded that substantially less vegetative cover and species diversity was observed. However, a limitation of this study is that it was conducted in a year of severe drought and study sites in the open OHV area were located relatively close to OHV staging areas. Therefore, the observations on OHV impacts to plant species do not apply to most of the OHV open area.



### 3.2.4 Special- Status and Endemic Wildlife Species

#### 3.2.4.1 Desert Tortoise (*Gopherus agassizii*)

The designation of special-status includes federal- and state-listed species under either the federal or California ESA, species proposed for federal listing, federal candidate species, and species designated as sensitive by the California State Director of the BLM. The following special-status wildlife and endemic beetle species are known or may occur within the Plan Area. Therefore, these species may be affected by the planned action. Descriptions of these species are provided below.

##### **Status**

The Mojave population of the desert tortoise was emergency listed by the USFWS as an endangered species in 1989. Under final rule, the species was federally listed as threatened in 1990 (Federal Register, 1990). The State of California listed this species as threatened in 1989. The BLM recognizes the desert tortoise as a special-status species. Currently, the BLM is drafting several management plans including the West Mojave Coordinated Management Plan (WEMO), Northern and Eastern Mojave Coordinated Management Plan (NEMO), and Northern and Eastern Colorado Coordinated Management Plan (NECO) (BLM, 2001a). An important focus of these plans is the management of the Mojave population of the desert tortoise and its habitat on BLM lands in California. A final recovery plan was completed by the USFWS in 1994 for the Mojave population of the desert tortoise (USFWS, 1994). Critical habitat for the Mojave population was also designated by the USFWS in 1994 (Federal Register, 1994). The Chuckwalla Bench Critical Habitat Unit for this species is located less than 5 miles northeast of the ISDRA.

##### **Life History**

The desert tortoise is a large herbivorous terrestrial reptile. It has a high domed shell that may reach a length of 15 inches or more. This species has stocky, elephant-like limbs and a short tail. The carapace (upper shell) is brown; and the plastron (lower shell) is yellow in color, both exhibiting prominent growth lines. Adult males can be distinguished from females by the concavity in their plastron. Adult males also have larger chin glands and a longer tail and gular horn than females (Stebbins, 1985).

The adult desert tortoise is active from mid-March or April to November, and during the winter months is dormant in underground burrows (Luckenbach, 1982; Zimmerman et al., 1994). Desert tortoises will congregate in winter dens during colder weather, then spread out to nearby areas during moderate weather in the spring and fall and retreat into short individual burrows or under shrubs during more the extreme heat of the summer (Woodbury and Hardy, 1940). During the active period, desert tortoises may establish home ranges of approximately 1 square mile. Tortoises feed on a wide variety of herbaceous plants, including cactus, grasses, and annual flowering plants (USFWS, 1994).

Adult desert tortoises reach sexual maturity at 15 to 20 years of age. Mating occurs in the spring (April and May) and the fall (August and September) with nesting and egg laying occurring from May to July (Rostral et al., 1994). The female tortoise lays her eggs in a hole approximately 3 to 4 inches deep that is



dug near the mouth of a burrow. Following egg laying, the female covers the eggs with soil (Woodbury and Hardy, 1948). Clutch size ranges from 2 to 14 eggs with an average of 5 to 6 eggs (Luckenbach, 1982). Desert tortoise eggs typically hatch from August through October. These hatchlings are provided a food source in the form of an egg yolk that is assimilated into the underside of the shell. This yolk sac will sustain the animal for up to 6 months. The hatchling desert tortoise will go into brumation in the late fall, but can be active on warm sunny or rainy days.

### **Distribution and Occurrence within the Plan Area**

The desert tortoise is widely distributed throughout the Mojave, Sonoran, and Colorado deserts. It occupies arid regions from southern Nevada and extreme southwestern Utah to northern Sinaloa, Mexico; southwestern Arizona west to the Mojave Desert and the eastern side of the Salton Basin, California (Stebbins, 1985).

In the Mojave region, desert tortoises are primarily associated with flats and bajadas with soils ranging from sand to sandy-gravel, but firm enough for the tortoise to construct burrows (USFWS, 1994). In California, the desert tortoise is most commonly found in association with creosote bush scrub with intershrub space for growth of herbaceous plants. However, it may also occur in saltbush scrub, desert wash, desert scrub, and Joshua tree woodlands. The desert tortoise is found from below sea level to elevations of 5,000 feet in California. The most favorable habitats occur at elevations of approximately 1,000 to 3,000 feet.

Desert tortoise habitat in the general vicinity of the ISDRA has been degraded and fragmented by OHV and camping use, agricultural development, utility corridors, and the construction and maintenance of the railroad and All American Canal. Along the eastern boundary of the ISDRA, the creosote bush scrub habitat and the desert washes north and south of SR-78 provide marginal suitable habitat for the desert tortoise. Desert tortoises have been observed by BLM and Border Patrol officials in the general vicinity crossing Vista Mine and Ted Kipf Roads. To date, surveys for desert tortoise have not been conducted at the ISDRA. Desert tortoise distribution and abundance data do not currently exist. The BLM proposes to conduct surveys to collect such data on this species at a latter date.

### **Threats**

The decline in the desert tortoise population is attributed primarily to habitat loss, degradation, and fragmentation resulting from increased human population and urbanization in the desert and arid regions of the southwestern United States. The increase in urbanization, collection of tortoises for pets, overgrazing, landfills, subsidized predation, highway mortality, vandalism, agriculture, fire, drought, and OHV use all have contributed to the decline of the tortoise in the wild (Luckenbach, 1982; Federal Register, 1990). Another important reason for the decline of the desert tortoise is the introduction of an upper respiratory tract disease (URTD) into many of the wild populations



(Berry, 1986). This disease was thought to have been introduced through the illegal release of captive desert tortoises into the wild (USFWS, 1994).

**3.2.4.2 Flat-tailed Horned Lizard**  
**(*Phrynosoma mcalli*)**

**Status**

In California, the flat-tailed horned lizard was designated a sensitive species by the BLM in 1980. In 1988, a petition was submitted to the CFGC to list the species as endangered. In 1989, the commission voted against the proposed listing. In 1993, the USFWS published a proposed rule to list the flat-tailed horned lizard as a threatened species (Federal Register, 1993). No final rule on the proposed listing was issued. In 2001, the USFWS published a notice of reinstatement of the 1993 proposed listing of the flat-tailed horned lizard as a threatened species and reopened the comment period on the proposed rule (Federal Register, 2001). Currently, the State of California and BLM recognize the flat-tailed horned lizard as a species of special concern and special-status species, respectively.

**Life History**

The flat-tailed horned lizard has the typical flattened body shape of horned lizards. It is distinguished from other species in its genus by its dark ventral stripe, lack of external openings, broad flat tail, and comparatively long spines on the head (Funk, 1981). The flat-tailed horned lizard has two rows of fringed scales on each side of its body. The species has cryptic coloring, ranging from pale gray to light rust brown dorsally and white or cream ventrally with a prominent umbilical scar. The only apparent external difference between males and females is the presence of enlarged postanal scales in males. Maximum snout-vent length for the species is 3.3 inches (Muth and Fisher, 1992).

Flat-tailed horned lizards escape extreme temperatures by digging shallow burrows in the loose sand. Adults are primarily inactive from mid-November to mid-February. Juvenile seasonal activity is often dependent on temperature fluctuations. Breeding activity takes place in the spring with young hatching in late July and September. The diet of horned lizards typically consists of greater than 95 percent native ant species, mostly large harvester ants (*Pogonomyrmex* spp.).

**Distribution and Occurrence within the Plan Area**

The flat-tailed horned lizard is found in the low deserts of southwestern Arizona, southeastern California, and adjacent portions of northwestern Sonora and northern Baja. In California, the flat-tailed horned lizard is restricted to desert washes and desert flats in central Riverside, eastern San Diego, and Imperial Counties. The majority of the habitat for the species is in Imperial County (Turner et al., 1980).

The lizard is known to inhabit sand dunes, sheets, and hummocks, as well as gravelly washes. The species is thought to be most abundant in creosote bush scrub habitat. However, this species may also be found in desert scrub, desert wash, succulent shrub, alkali scrub, sparsely vegetated sandy flats, desert pavement, and rocky slopes. They are typically found in dry, hot areas of low elevation (less than 800 feet).



Suitable habitat for the flat-tailed horned lizard is found east of the project area from Ogilby Road and extending south to the All-American Canal (FERC, 2001). Monitoring conducted as part of the North Baja Pipeline Project in 2000 and 2001 detected flat-tailed horned lizard in this area (FERC, 2001). Rado noted that sand sheets extending east from the sand dunes provide favorable habitat for about 1 mile northwards from the intersection of Ogilby Road and I-8 (Rado, 1995).

The surveys conducted by the BLM in 1978, 1979, and 1980 reveal that the highest abundance of this species occurs southwest of the ISDRA in the East Mesa ACEC. Low abundance of this species was detected on the eastern and western boundaries of the sand dunes, predominantly in the creosote bush scrub habitat. Although this species is known to occur in the central Imperial Sand Dunes, the habitat is considered to be marginal because of the lack of suitable soil structure required to support their predominant prey: harvester ants (BLM, 2001b). Figure 3.2-7 depicts the distribution and abundance of this species at the ISDRA.

### Threats

Human activities have resulted in the conversion of approximately 34 percent of the historic habitat of the flat-tailed horned lizard. The decline in the flat-tailed horned lizard population is primarily due to impacts from utility lines, roads, geothermal development, sand and gravel mining, OHV use, waste disposal sites, military activities, pesticide use, and Border Patrol activities (Foreman, 1997). Harvester ants, the horned lizards primary prey, are particularly sensitive and easily displaced by Argentine ants (UCSC, 2001). Currently, the Argentine ants (*Linepithema humile*), an invasive species, are moving up the California coastline with drastic effects on native ant species (Gordon, 1997). California harvester ants suffer undue losses and plants that depend on them for seed dispersal may also suffer. Horned lizard abundance is strongly correlated to the absence of Argentine ants and subsequent presence of native ant species, indicating that the Argentine ants are indirectly affecting the horned lizard population (UCSC, 2001).

#### 3.2.4.3 Colorado Desert Fringe- Toed Lizard (*Uma notata*)

### Status

The Colorado Desert fringe-toed lizard is a federal candidate for listing and State of California species of special concern. It is also recognized by the BLM as a sensitive species.

### Life History

The fringe-toed lizard is a flattened, sand-dwelling lizard with characteristic fringed toes. The species is cryptic in color ranging from a sand color dorsally and white or cream ventrally. It also has pronounced dark lines on the throat, underside of the tail, and sides of the belly. The sides of the belly may also have vivid orange streaks especially during the breeding season. The only apparent external difference between males and females is the presence of enlarged postanal scales in males. Maximum snout-vent length for the species is 4.8 inches (Stebbins, 1985).



This species escapes extreme temperatures by digging shallow burrows in the loose sand deposits, often in primary and secondary dunes at the base of bushes in psammophytic and creosote bush scrub habitats. Adults are primarily inactive from mid-November to mid-February. Juvenile seasonal activity is often dependent on temperature fluctuations. Breeding activity takes place in the spring. This species primarily feeds on insects, but occasionally eats other lizards. They are also known to feed on buds, leaves, and flowers of plants.

#### **Distribution and Occurrence within the Plan Area**

The range of this species is from the vicinity of the Salton Sea and Imperial Sand Dunes, south across the Colorado River Delta to the Gulf of California and Tepopca Bay in Baja California. The fringe-toed lizard is largely restricted to fine, loose, wind-blown sand of dunes, flats, riverbanks, and washes. Vegetation is usually sparse, consisting of creosote bush or psammophytic scrub. The Colorado Desert fringe-toed lizard is known to occur within the Plan Area. To date, the BLM has conducted several surveys for fringe-toed lizards at the ISDRA. Figure 3.2-8 depicts the distribution and abundance of this species at the ISDRA.

#### **Threats**

Threats to Colorado fringe-toed lizard populations are to those described for the flat-tailed horned lizard.

#### **Status**

Couch's spadefoot toad is recognized by the State of California as a species of special concern and as a sensitive species by the BLM.

#### **Life History**

The Couch's spadefoot toad is distinguished from true toads by its cat-like eyes, single sharp-edged black spade on its hind foot, teeth in the upper jaw, and rather smooth skin. The pupils of this species are vertical in bright light and round at night. Couch's spadefoot toad is greenish yellow to brownish yellow with an irregular network of dark blotches dorsally and generally whitish ventrally. Males generally have a dusky throat, dark nuptial pads on the innermost front toes, and are often more greenish than the females. Their voice is a plaintive cry or groan, declining in pitch like the anxious bleat of a sheep (Stebbins, 1985).

They are generally active at night during spring and early summer rains and can be found in temporary desert rain pools with an insect food base available. Breeding is primarily from May-September during rainfall periods. They require friable soil for burrowing where they typically spend up to 11 months underground until sufficient rainfall has occurred.

#### **Distribution and Occurrence within the Plan Area**

The Couch's spadefoot toad occupies a variety of habitat types, including desert dry wash woodland, creosote bush scrub, desert riparian, palm oasis, desert succulent scrub, shortgrass plains, mesquite savannah, and alkali sink scrub. In California, the Couch's spadefoot toad occurs within Imperial,

#### **3.2.4.4 Couch's Spadefoot Toad (*Scaphiopus couchi*)**



Riverside, and San Bernardino Counties between 500 to 3,000 feet elevation. Scattered populations are known between Amos and Ogilby on the eastern boundary of the Imperial Sand Dunes. This species may occur in the microphyll woodland, desert dry wash, and creosote bush scrub habitats in the eastern portion of the Plan Area. To date, the BLM has not conducted any surveys for this species at the ISDRA. Therefore, Couch's spadefoot toad distribution and abundance data do not currently exist.

#### **Threats**

No specific threats to Couch's spadefoot toad are known. Potential threats to this species include loss, fragmentation, or degradation of habitat.

#### **Status**

The Gila Woodpecker is listed as endangered by the State of California. It is also recognized by the BLM as a special-status species.

#### **Life History**

The Gila Woodpecker is a "zebra-backed" woodpecker. The males have a red cap on top of their head. The head and under parts are typically gray-brown. The Gila Woodpecker feeds mainly on insects, mistletoe berries, cactus fruits, corn; and occasionally contents of galls on cottonwood leaves, bird eggs, acorns, and cactus pulp. The species breeds from April through July, with peak activities in April and May. They are cavity nesters and may use abandoned owl cavities.

#### **Distribution and Occurrence within the Plan Area**

The Gila Woodpecker's preferred habitat is mesquite-dominated microphyll woodlands and desert dry washes. They also occupy orchard-vineyards (specifically, date palm groves) and urban areas (shade trees). This species was formerly prolific throughout the Imperial Valley. Due habitat degradation, most of the current populations are concentrated in the Brawley, California, area (CDFG, 2001). Brawley is located approximately 20 miles west of the Plan Area. At the Plan Area, this species may occur in the microphyll woodland habitat on the eastern side of the Imperial Sand Dunes. To date, the BLM has not conducted any surveys for this species at the ISDRA. Therefore, Gila Woodpecker distribution and abundance data do not currently exist.

#### **Threats**

Loss, fragmentation, or degradation of riparian woodland to development has displaced the woodpecker from some areas. Additionally, European Starlings are competing with this species for nest cavities (CDFG, 2001).

#### **Status**

This species is recognized by the State of California as a species of special concern and as a sensitive species by the BLM.

#### **Life History**

This species of owl is identified by its barred and spotted plumage, white chin stripe, round head, and stubby tail. The Western Burrowing Owl is a diurnal

#### **3.2.4.5 Gila Woodpecker (Melanerpes uropygialis)**

#### **3.2.4.6 Burrowing Owl (Athene cunicularia)**



(daylight active) species that is nonmigratory in this portion of its range. Burrowing Owls are opportunistic feeders, preying upon arthropods, small mammals, birds, and sometimes reptiles and amphibians. This species breeds from late April through July in the Imperial Valley. Burrowing owls are subterranean nesters, typically found using burrows made by small mammals such as ground squirrels and badgers. The Burrowing Owl commonly perches on fence posts or on top of mounds outside its burrow.

### **Distribution and Occurrence within the Plan Area**

Found throughout much of the western United States, this species inhabits open, dry grasslands, deserts, agricultural areas, and scrublands characterized by low growing vegetation. These owls also occupy open areas of airports, golf courses, and vacant urban lots. They are generally found at elevations ranging from 200 feet below sea level to 9,000 feet. Throughout the Imperial Valley, burrowing owls are frequently found along unlined agricultural canals and drainages. It is typically found in low densities in desert habitats, but can occur in much higher densities near agricultural lands where rodent and insect prey is more abundant. There are no known records of this species at the Plan Area. The psammophytic habitat is not suitable for this species. However, the creosote bush scrub and microphyll woodland habitats on the eastern boundary of the Imperial Sand Dunes are suitable for Burrowing Owls. To date, the BLM has not conducted any surveys for this species at the ISDRA. Therefore, Burrowing Owl distribution and abundance data do not currently exist.

### **Threats**

Threats to this species include habitat degradation, disturbance to nesting and roosting sites, and pesticides and other contaminants/toxins. Agricultural practices that reduce the ground squirrel population result in a reduction of the available nesting and roosting sites for the Burrowing Owl.

### **Status**

This species is recognized by the State of California as a species of special concern and as a sensitive species by the BLM.

### **Life History**

The LeConte's Thrasher is pale gray-brown in color, with a long tail, and recurved bill. They typically run before taking flight. LeConte's Thrashers feed on seeds, insects, small lizards, and other small vertebrates. This species requires areas with an accumulated leaf litter that serves as cover for its primarily arthropod prey. Only during breeding activities, when males sing from exposed perches, are they relatively easy to detect.

### **Distribution and Occurrence within the Plan Area**

LeConte's Thrasher is a desert resident of areas with sparse desert scrub, alkali desert scrub, and desert succulent scrub habitats with open desert washes (CNDDDB, 2001). It is found year-round throughout much of the Mojave and Colorado Deserts of California. Population densities of this species are among the lowest of passerine (perching) birds, estimated at less than five birds per square mile in optimum habitat. At the ISDRA, the

#### **3.2.4.7 LeConte's Thrasher (*Toxostoma lecontei*)**



creosote bush scrub habitat and the desert washes on the eastern side of the Plan Area may provide suitable habitat for the LeConte's Thrasher. To date, the BLM has not conducted surveys for this species at the ISDRA. Therefore, LeConte's Thrasher distribution and abundance data do not currently exist.

### Threats

OHV activity and other human disturbance are considered disruptive to this species, especially during the breeding season (late January to early June). OHV use can crush vegetation and destroy the underlying litter and soil surface thereby precluding heavily used sites from further use by this species (Sheppard, 1996).

#### 3.2.4.8 Andrews' Dune Scarab Beetle (*Psuedocotalpa a andrewsi*)

Likely endemic to the Imperial Sand Dunes, Andrews' dune scarab beetle is found primarily along the eastern edge of the dunes in the transitional zone between creosote bush scrub, psammophytic scrub, and microphyll woodland habitats. Little is known about the biology of this beetle. Current information about the distribution and preferred habitat at the Plan Area is not available (CNDDDB, 2001). There are no confirmed host plants identified of the Andrews' dune scarab beetle. However, the adults of this species are known to swarm around creosote bushes, and may utilize the subsurface wet sand to regulate body temperature during the day (CNDDDB, 2001). No information about threats to this species is available.

#### 3.2.4.9 Carlson's Dune Beetle (*Anomala carlsoni*)

The Carlson's dune beetle is likely endemic to the Imperial Sand Dune system; however, there is limited information available about the microhabitat requirements or basic biology of this species (CNDDDB, 2001). The adult beetle is known to be active at dusk, generally on north- or east-facing slip faces. Generally, it seeks the transitional zone between creosote bush scrub, psammophytic scrub, and microphyll woodland habitats. Although there is no known host plant, the adult beetle has been sifted (collected) from a wide variety of plants (CNDDDB, 2001). No information about threats to this species is available.

#### 3.2.4.10 Hardy's Dune Beetle (*Anomala hardyorum*)

Hardy's dune beetle is likely endemic to the Imperial Sand Dunes and is found primarily in the eastern portion of the ISDRA. The adult beetle is known to be active at dusk, generally on north- or east-facing slip faces. Generally, it seeks the transitional zone between creosote bush scrub, psammophytic scrub, and microphyll woodland habitats. The beetle also inhabits troughs of loose, drifting sand between the dune crests (BLM, 1987). Although there is no known host plant, the adult beetle has been sifted (collected) from a wide variety of plants (CNDDDB, 2001). No information about threats to this species is available.



### 3.3 LAW ENFORCEMENT AND PUBLIC SAFETY

#### 3.3.1 Regulatory Framework

United States Congress recognized that law enforcement on BLM-managed public lands was needed to ensure public safety and to protect resources. In 1976, BLM was given law enforcement authority with the passage of FLPMA. BLM law enforcement officers (LEOs) are responsible for protecting public safety and resources within the 264 million acres of BLM-managed public land in the U.S. BLM officers accomplish this in partnership with other federal, state, and local law enforcement agencies.

BLM El Centro law enforcement officers patrol the ISDRA, and are tasked with a variety of services, including:

- Educating the public on the rules and regulations
- Providing security at recreation sites
- Preventing theft of and damage to biological and cultural resources
- Assisting in emergency response situations
- Enforcing the rules and regulations through the issuing of warning and citations and, if necessary, by making arrests

BLM El Centro, Law Enforcement, enforce both state and federal regulations in the dunes. Current statistics for recorded incidents at ISDRA, as well as personnel and equipment available to BLM El Centro, Law Enforcement, to perform their tasks are discussed below.

#### 3.3.2 Recorded Incidents

##### 3.3.2.1 Emergency Response - Medical Aid and Fatalities

During the 2000-2001 Visitor Season, approximately 147 incidents that required medical aid to be provided occurred over the six major holiday weekends. This represents an average of 25 medical aid incidents per major holiday weekend. Based on an average of 55,000 visits per major holiday weekend (attendance can swell to over 100,000 visits during Thanksgiving weekend), approximately 1 reported medical aid incident occurs per 2,200 visitors. The number of fatalities averaged approximately one per busy holiday weekend during the 2000-2001 Visitor Season.

Table 3.3-1 lists a summary of documented medical aid responses and fatalities (1995 to 2001) provided by BLM El Centro, Law Enforcement. Records prior to 1995 are not available, and medical aid has not been fully documented over the years. The numbers shown in Table 3.3-1 do not capture each time aid was provided by BLM staff (BLM, 2001d).



**Table 3.3-1 Documented Medical Aid Responses and Fatalities: 1995 to 2001 – Imperial Sand Dunes Recreation Area**

YEAR	DOCUMENTED MEDICAL AID RESPONSES	DOCUMENTED FATALITIES
1995	165	0
1996	131	0
1997	210	5
1998	176	8
1999	151	5
2000	145	6
2001	147	8

Source: Hamada, 2001 – Personal Communication from Neil Hamada/BLM – El Centro to Elizabeth Cutler/CH2M HILL, October 30, 2001 – BLM unpublished data.

During the 2000-2001 Visitor Season, approximately 3,530 citations/arrests occurred over the six major holiday weekends. On average, this represents approximately 588 citations and/or arrests per major holiday weekend or 1.1 citations/arrests per 1,000 visits. Based on an average of 29 law enforcement staff present over six major holiday weekends, each staff handled about 20 citations/arrests. The largest number of law enforcement incidents occur in Gecko Campground and Garbage Flats (BLM, 2001g).

Violation notices tracked by BLM El Centro, Law Enforcement, include the following categories:

- Registration
- Minor in Possession
- No Helmet
- Double Riding
- No Lights
- Resisting
- Open Container
- No Safety Flag
- Closed Area
- Vendor Permit
- Controlled Substance
- Use Fee
- Ride in Pickup Bed
- Natural Feature Destruction
- Speeding
- Possession of Marijuana
- Furnishing Alcohol to Minor
- Revoked License
- Dumping
- Glass Container
- Create Hazard
- Litter
- Concealed (Loaded) Firearm



Arrests tracked by BLM El Centro, Law Enforcement, include the following categories:

- DUI
- DUI/Felony Evade
- Assault
- Felony Evade
- Warrant
- Drugs
- Explosive Device
- Inciting Riot
- False Information
- Auto Theft
- Possession of Stolen Property
- Interference

Reports (including accidents) tracked by BLM El Centro, Law Enforcement, include the following:

- Assault
- Stolen Vehicle
- Weapon in Vehicle
- Drugs Seized
- Accidents
- Felony Hit and Run
- Child Endangerment
- Mexican Detainees
- Resisting Arrest
- Resisting Issuance
- Abandoned Vehicles
- Seized Marijuana
- Seized Marijuana/Paraphernalia
- Vehicles Towed
- Vehicles Seized
- Train Accidents

Table 3.3-2 provides a summary of violation notices, arrests, and reports (including accidents) that BLM El Centro LEOs issued for the six major holiday weekends during the 2000-2001 season.

**Table 3.3-2 Total Violation Notices, Arrests, and Reports Including Accidents During Major Holiday Weekends: 2000-2001 – Imperial Sand Dunes Recreation Area**

HOLIDAY WEEKEND	NUMBER OF INCIDENTS
Halloween – 2000	260
Thanksgiving - 2000	1,501
New Year's – 2001	409
Martin Luther King – 2001	191
Presidents Day – 2001	860
Easter – 2001	308

Source: BLM unpublished data, 2001.

### 3.3.3 Law Enforcement Personnel

BLM El Centro LEOs are “delegated” officers with the authority to arrest, carry a gun, and wear a badge; therefore, each officer must meet specific employment qualifications, which include:

- Graduate of a Law Enforcement Academy
- Emergency Medical Technician (EMT) certification or First Responder Training (minimum)



- State Peace Officer Authority certification (for state arrests through Imperial County) (required for sand dunes rangers)
- Specialized driver training (OHV training: vehicles/dune buggies/quadrupeds) for primary operation in sand

The BLM, El Centro Field Office, has a staff of nine delegated LEOs (one Chief, one Supervisor, and seven Rangers) and one nondelegated LEO (trainee) who conduct regular patrols of the ISDRA. Patrol areas are designated as North Sand Dunes and South Sand Dunes. Various vehicles (e.g., quadrupeds and dune buggies) are used to patrol the interior of the dunes to monitor OHV use. Most visitors stay within 1 mile of paved roads and the Sand Highway; however, with the increased use of global positioning system (GPS) units, visitors are starting to venture further into the inner dunes (BLM, 2001h).

Additional staffing resources include BLM staff from other offices, as well as other federal and state agencies including National Park Service (NPS), USFWS, U.S. Border Patrol (USBP), California Highway Patrol (CHP), Imperial County Sheriff's Department, Imperial County Police Department, Brawley Police Department, El Centro Police Department, Calipatria Police Department, and Calexico Police Department. These additional resources are typically brought in over the six major holiday weekends (Halloween, Thanksgiving, New Year's, Martin Luther King, Presidents Day, and Easter). Some additional staffing resources are delegated law enforcement officers; others do not have the authority to arrest, but are capable of detaining individuals until delegated enforcement officers can arrive. Additional resources currently include up to 10 staff provided by the Imperial County Sheriff's office on a regular basis over major holiday weekends.

BLM El Centro, Law Enforcement, determined the number of LEOs needed for each holiday weekend (Year 2000-2001) to provide services for the ISDRA Plan Area (Table 3.3-3). Actual enforcement staff available (delegated and nondelegated personnel) over major holiday weekends is presented in Table 3.3-3. Data are available for 2000-2001 only.

A total of 172 law enforcement staff was present during the six major holiday weekends (not including 17 volunteer Boy Scouts) or an average of 29 law enforcement staff during each major holiday weekend (BLM, 2001d). On average, 19 law enforcement staff were provided during each busy holiday weekend in addition to the 10 permanent BLM staff. Assuming approximately 50 percent of all visits occur over the six major holiday weekends, approximately 1 law enforcement staff per 1,900 visits was provided. As noted in Table 3.3-3, the total number of LEOs needed approximates actual staff provided. However, without the 17 volunteer scouts, actual staff were around 10 percent below needed staff.



**Table 3.3-3 Staffing Data for Holiday Weekends: 2000-2001 – Imperial Sand Dunes Recreation Area**

<b>HOLIDAY WEEKEND</b>	<b>NUMBER OF LEOS NEEDED<sup>1</sup></b>	<b>ACTUAL STAFF AVAILABLE (DELEGATED AND NONDELEGATED)</b>
Halloween – 2000	28	17
Thanksgiving – 2000	44	57 <sup>2</sup>
New Year's – 2001	30	21
Martin Luther King – 2001	20	23
Presidents Day – 2001	36	52
Easter – 2001	30	19

<sup>1</sup>Per Bob Haggerty, BLM El Centro

<sup>2</sup>Includes 17 Scout team members

Source: BLM unpublished data, 2001

### 3.3.4 Public Safety Facilities and Equipment

The BLM, El Centro Field Office, has one permanent ranger station within the dunes area: Cahuilla Ranger Station is located on Gecko Road, within the most heavily visited area. The ranger station is open approximately 14 hours each day during holiday periods (approximately 20 days per year). On nonholiday weekends, the ranger station is open approximately 8 hours per day.

Additionally, during holiday weekends, two temporary contact stations are set up, one in Dunebuggy Flats and the other in the Buttercup areas. Law Enforcement shares facilities with the park rangers; there is no specific area reserved only for law enforcement use (including detention of serious violators).

The closest hospital to the North Dunes area is Pioneer Memorial, located in Brawley, approximately 35 miles from the ISDRA. The closest hospitals to the South Dunes area are Yuma Regional in Winterhaven, located approximately 10 miles from the ISDRA; and El Centro Regional Medical Center in El Centro, located approximately 20 miles from the ISDRA.

Currently, procedures vary for reporting incidences within the dunes. In particular, the first point of contact varies, and can include the ranger station, 911 (contacts Imperial County Sheriff Department, who then contacts a BLM ranger), and direct calls to Imperial County Sheriff Department (who then contacts a BLM ranger).

Safety equipment provided for the express use of BLM El Centro Law Enforcement is listed in Table 3.3-4. Those items with a zero quantity have been identified as an equipment need by BLM staff.



**Table 3.3-4 BLM El Centro Law Enforcement Equipment – Imperial Sand Dunes Recreation Area**

QUANTITY	ITEM	QUANTITY	ITEM
3	Pickup Trucks (4x4)	1	Dune buggy
7	SUVs (4x4)	6	Quad runners
6	ATVs	10	GPS Units
0	Law Enforcement Holding Facility	10	Cell phones
0	Facilities dedicated to Law Enforcement	10	Laptop computers
0	Equipment Garage Bay	0	Working radio communication system, with access to CLETS, NLETS, and NCIC <sup>1</sup>
1	Residential Facility separate from Station	\$0.00	Law Enforcement Miscellaneous Supplies
1	Flat-bed dune buggy trailer	10	Radios, hand held
1	Enclosed dune buggy trailer	10	Radios, trucks/SUVs
0	911 call stations in Dunes campgrounds	0	Search and Rescue Equipment (including advanced-level life support system and automatic external defibrillators)

<sup>1</sup>California Law Enforcement Telecommunication System (CLETS), National Law Enforcement Telecommunication System (NLETS), and National Crime Information Center (NCIC)

Source: BLM unpublished data, 2001 – personal communication: Bob Haggerty/BLM El Centro Law Enforcement to Elizabeth Cutler/CH2M HILL, November 26, 2001g.

Additional equipment and materials available for use by BLM El Centro Law Enforcement from other departments at the BLM El Centro Office are listed in Tables 3.3-5, 3.3-6, and 3.3-7. Equipment and materials available from BLM El Centro, Recreation, are listed in Table 3.3-5; equipment available from BLM El Centro, Resources, are listed in Table 3.3-6; and equipment available from BLM El Centro, Maintenance, are listed in Table 3.3-7. Those items with a zero quantity have been identified by BLM staff as an existing equipment need.



**Table 3.3-5 Equipment and Materials Available for use by BLM El Centro Law Enforcement (from BLM El Centro, Recreation) – Imperial Sand Dunes Recreation Area**

QUANTITY	ITEM	QUANTITY	ITEM
2	Rescue buggies	0	911 call stations in dunes campgrounds
10	4X4's	40	Radios, hand held
1	Ranger Station / Interpretive Center	10	Radios, for trucks
0	Communication Center (FICC)	1	Phone lines
1 Bay	Garage bays for equipment	6	ATVs
1	Emergency Medical Services (EMS) clinic	12	GPS units
0	Holding facility	12	Cell phones
2	Residential facilities – separate from Station	1	Lap-top computers
1	Flat-bed dune buggy trailer	0	Working radio communication system w/dedicated channels
0	Helipads	0	Search and rescue equipment
1	Rescue trailers	0	Helicopter on standby
2	Camper trailers – portable Ranger Stations	0	Advanced-level life support program
\$10,000/year	Medical supplies	0	Automatic external defibrillators

Source: Hamada, 2001 – Personal Communication from Neil Hamada/BLM – El Centro to Elizabeth Cutler/CH2M HILL, October 30, 2001d. BLM unpublished data.

**Table 3.3-6 Equipment Available for use by BLM El Centro, Law Enforcement (from BLM El Centro, Resources) – Imperial Sand Dunes Recreation Area**

QUANTITY	ITEM
2	Pickup truck(s) – 2x4
2	Pickup truck(s) – 4x4
1	Sport Utility Vehicle(s) – 2x4
3	Sport Utility Vehicle(s) – 4x4

Source: BLM, Fax from Roxie Trost/BLM El Centro (by Ray Romero) to Elizabeth R. Cutler/ CH2M HILL, November 5, 2001e. BLM unpublished data.



**Table 3.3-7 Equipment Available for use by BLM El Centro, Law Enforcement (from BLM El Centro, Maintenance) – Imperial Sand Dunes Recreation Area**

QUANTITY	ITEM	QUANTITY	ITEM
1	18-wheel Low Boy	1	Bobcat 843, plus attachments
1	16,000-gallon water tank	0	Backhoe (CASE 580 4-wheel drive or equivalent)
1	10-yard dump truck	1	Road grader
1	20-ton tilt equipment trailer	2	Stake bed trucks
1	CASE 821 Front-end Loader		
1	CASE 850 Bulldozer		

Source: Personal Telephone Communication, Steve Geyman/BLM El Centro, Maintenance, to Elizabeth R. Cutler/CH2M HILL, November 5, 2001e. BLM unpublished data.



## 3.4 SOCIOECONOMICS

### 3.4.1 Introduction

The ISDRA is located within Imperial County, California, near Yuma County, Arizona, to the east and the Mexican border to the south. For purposes of the socioeconomic analysis, the study area includes Imperial County, California, and Yuma County, Arizona.

This resource draws recreation visitors from major population centers including San Diego and Los Angeles, California, as well as Phoenix and Tucson, Arizona. However, the majority of the socioeconomic impacts associated with trips to the recreation area are assumed to stay within Imperial County where the dunes are located with some spillover occurring in Yuma County, Arizona. For example, residents of Imperial and, to a lesser extent, Yuma Counties gain employment and income from local expenditures by ISDRA visitors from outside the region. Only expenditures by nonlocal visitors represent injections of new dollars into the regional economy. Examples of expenditures that remain in these two counties are those relating to the purchase of supplies such as fuel, parts, food, camping supplies, and medication. For the larger capital items such as the recreational vehicles (RVs) and OHVs, it is assumed that the recreationists (duners) purchase these items from outside of Imperial and Yuma Counties. In addition to the creation of employment and income opportunities, residents of Imperial and Yuma Counties also benefit from the proximity to the recreation area.

The affected environment discussion for socioeconomics includes information on regional employment, income, finance, and demographic characteristics. Socioeconomic data are generally at the County level, and this section will describe the socioeconomic conditions at the county level for both Imperial and Yuma.

### 3.4.2 Imperial County, California 3.4.2.1 Population

Imperial County occupies an area of 4,587 square miles in the southeastern corner of California. It is bounded on the north by Riverside County, on the west by San Diego County, on the south by Mexico, and on the east by the Colorado River and Yuma County, Arizona.

The Plan Area lies within a sparsely populated, unincorporated area of Imperial County. The 2000 census indicated that Imperial County had a total population of 142,361 (California DOF-1, 2001). There are seven incorporated cities in the county, the three largest being El Centro, Calexico, and Brawley with populations of 37,835; 27,109; and 22,052, respectively. Seventy-seven percent of the County's inhabitants live in the incorporated areas. Table 3.4-1 shows the county and city populations for Imperial County. Although the county has experienced population growth since the 1990 census, the distribution of the population among the cities is estimated to be about the same in 2000 as it was in 1990.



Table 3.4-1 Imperial County/City Population Estimates

COUNTY/CITY	1990	1990 PERCENTAGE OF TOTAL	2000	2000 PERCENTAGE OF TOTAL
Brawley	18,923	17	22,052	15
Calexico	16,633	17	27,109	19
Calipatria	2,690	3	7,289	5
El Centro	31,405	29	37,835	27
Holtville	4,820	4	5,612	4
Imperial	4,113	4	7,560	5
Westmorland	1,380	1	2,131	1
Unincorporated	27,339	25	32,773	23
Incorporated	81,964	75	109,588	77
County Total	109,303	100	142,361	100

Source: California DOF-1, 2001

Based on the 2000 census data, approximately 72 percent of the population of Imperial County was classified as Hispanic. Whites were the next largest ethnic group at 20 percent of the population. The remaining 8 percent of the county population was classified as African American, Asian and Pacific Islander, American Indian, or Other (including those identifying two or more racial backgrounds). These percentages are comparable to the 1990 data as shown in Table 3.4-2.

Table 3.4-2 Imperial County Racial Profile

RACE	1990	1990 PERCENTAGE OF TOTAL	2000	1997 PERCENTAGE OF TOTAL
White	31,901	29	28,768	20.2
Hispanic	71,935	66	102,817	72.2
African American	2,272	2.1	5,148	3.6
Asian and Pacific Islander	1,632	1.5	2,521	1.8
American Indian	1,563	1.4	1,736	1.2
Other <sup>a</sup>			1,371	1.0
Total	109,303	100	142,361	100

Source: California DOF-2, 2001; 2000 U.S. Census

<sup>a</sup>The 2000 estimate for Others includes those identifying two or more racial backgrounds. Two or more racial background identification was not part of the 1990 Census.



### 3.4.2.2 Housing

According to estimates from the 2000 U.S. census, Imperial County had 43,891 housing units in 2000 with a vacancy rate of 10.3 percent. The number of households was 39,384 households with an estimated 3.6 persons per household (California DOF-3, 2001).

### 3.4.2.3 Employment and Income

The civilian labor force in Imperial County in 2000 was about 58,500. The average unemployment rate in the civilian labor force was 26.3 percent, compared to 4.9 percent for the State (California EDD, 2001). Historically, Imperial County has had one of the highest unemployment rates within the state, approaching 30 percent during the 1990s. The primary employment sectors in the county are the government, agriculture, trade, and service. Table 3.4-3 shows the major employment sectors for 2000.

The agriculture and government sectors are the dominant sectors in the county providing approximately one in two jobs. The bulk of the other jobs is in the trade (both wholesale and retail) and services sectors. Retail trade employs 8,300 people and accounts for 16.7 percent of the industry employment. Services employ 5,700 and account for 11.4 percent of the industry employment.

The per capita income for Imperial County in 1999 was \$17,550, one of the lowest in California and well below the state average of \$29,856 (California DOF-4, 2001). Median family income for 1990 (the 2000 Census estimates on income are expected to be released in April 2002) was estimated at \$25,147. The percent of person below the poverty level in 1990 was 23.8 percent compared to 12.5 percent for the state (California DOF-5, 2001).

**Table 3.4-3 Summary of Imperial County Employment Data, 2000**

	EMPLOYMENT NUMBERS	PERCENTAGE OF TOTAL
Agriculture	11,300	22.7
Construction and Mining	2,100	4.2
Manufacturing	1,900	3.8
Transportation and Public Utilities	1,900	3.8
Wholesale Trade	2,100	4.2
Retail Trade	8,300	16.7
Finance, Insurance and Real Estate	1,100	2.2
Services	5,700	11.4
Government:	15,500	31.1
Federal Government	1,800	3.6
State and Local Government	13,700	27.5
Total Industry Employment	49,800 <sup>a</sup>	100.0

Source: California EDD, 2001.

<sup>a</sup>Difference in totals is due to the differences in labor force and employment-by-industry data.



### 3.4.2.4 Finance

Taxable retail sales in Imperial County was \$871.2 million in 1999 (California DOF-6, 2001). This represents about 0.3 percent of total state retail sales. The sales tax rate in the county is 7.5 percent.

### 3.4.3 Yuma County, Arizona

#### 3.4.3.1 Population

Yuma County occupies an area of 5,522 square miles in the extreme southwest corner of Arizona. It is bordered by the Colorado River and Imperial County, California, on the west and Mexico on the south.

The 2000 census indicated that Yuma County had a total population of 160,026 (Census, 2000). There are seven incorporated cities in the county, the three largest being Yuma, Fortuna Foothills CDP, and San Luis with populations of 77,515; 20,478; and 15,322, respectively. Sixty-four percent of the inhabitants of the county live in the incorporated areas. In Yuma County, the City of Yuma is the population center nearest to the Plan Area. Recreationists from the Phoenix, Arizona, area stop at the City of Yuma to stock up on most of the supplies for their visits to the ISDRA. Table 3.4-4 shows the county and city population for Yuma County.

**Table 3.4-4 Yuma County/City Population Estimates**

COUNTY/CITY	1990	1990 PERCENTAGE OF TOTAL	2000	2000 PERCENTAGE OF TOTAL
Fortuna Foothills CDP	7,737	7.2	20,478	12.8
Gadsden CDP	NA	NA	953	0.6
San Luis City	4,212	3.9	15,322	9.6
Somerton City	5,282	4.9	7,266	4.5
Tacna CDP	NA	NA	555	0.3
Wellton town	1,066	1.0	1,829	1.1
Yuma City	54,923	51.4	77,515	48.4
Unincorporated	41,412	38.7	58,094	36.3
Incorporated	65,483	61.3	101,932	63.7
County Total	106,895	100	160,026	100

Source: Arizona DES-1 and DES-2, 2001

NA = Not available

Hispanics comprise the largest racial group accounting for 50.5 percent of the 2000 population of the county. Whites are the second largest racial classification comprising 44.3 percent of the population, while the remaining racial classification of African American, Asian and Pacific Islander, and American Indian comprise approximately 2.0, 0.9, and 1.1 percent of the population, respectively. Table 3.4-5 summarizes the racial profile of Yuma County with a comparison to 1990 data. As the data indicate, the number of Hispanics has increased from about 40 percent of the population of the county in 1990 to about 51 percent in 2000. This increase in the percentage of Hispanics has been accompanied by a decrease in the White population from 54.4 percent in 1990 to 44.3 percent in 2000.



Table 3.4-5 Yuma County Racial Profile

RACE	1990	1990 PERCENTAGE OF TOTAL	2000	1997 PERCENTAGE OF TOTAL
White	58,151	54.4	70,956	44.3
Hispanic	43,388	40.6	80,772	50.5
African American	2,776	2.6	3,136	2.0
Asian & Pacific Islander	1,188	1.1	1,494	0.9
American Indian	1,178	1.1	1,819	1.1
Other	214	0.2	1,849	0.2
Total	106,895	100	160,026	100

Source: Arizona DES-3, 2001 and Arizona DES-4, 2001

### 3.4.3.2 Employment

The average civilian labor force in Yuma County in 2000 was about 65,700. The average unemployment rate in the civilian labor force was 27.5 percent compared to 3.9 percent for the state (Arizona DES-5, 2001). The primary employment sectors in the county are the government, trade, and services. Table 3.4-6 shows the major employment sectors for 2000.

Table 3.4-6 Summary of Yuma County Employment Data, 2000

	EMPLOYMENT NUMBERS	PERCENTAGE OF TOTAL
Agriculture	7,475	15.7
Construction and Mining	2,750	5.8
Manufacturing	2,200	4.6
Transportation and Public Utilities	1,550	3.3
Trade	11,250	23.6
Finance, Insurance and Real Estate	1,325	2.8
Services	9,625	20.2
Government:	11,425	24.0
Federal Government	2,075	4.4
State and Local Government	9,350	19.6
Total Industry Employment	47,600 <sup>a</sup>	100.0

Source: Arizona DES-5, 2001.

<sup>a</sup>Difference in totals is due to the differences in labor force and employment-by-industry data.

The government, trade, and services sectors are the dominant sectors in the county providing one out of every three jobs. The government sectors (federal, state, and local) employ 11,425 people (about 24 percent), whereas the trade sectors employ 11,250 people (about 24 percent). The services sector employs 20.2 percent (or 9,625) of the labor force.



**3.4.3.3 Income**

The per capita income for Yuma County in 1999 was \$18,452 ranking 10th out of the 15 counties in Arizona. The average per capita income for the state was approximately \$25,173. Median family income for 1990 (the 2000 census estimates on income are expected to be released in April 2002) was estimated at \$23,635 (Arizona DES-6, 2001). In 1990, the poverty rate stood at 19.9 percent, a figure that is more than the state average of 15.7 percent (Arizona DES-7, 2001).

**3.4.3.4 Finance**

Taxable retail sales in Yuma County was \$780 million in 1999. (Smith, 2002). This represents about 2 percent of total state retail sales. The sales tax rate in the county in 1999 was 7.10 percent (Heugly, 2002).



### 3.5 LAND USE AND LAND OWNERSHIP

#### 3.5.1 Regional Setting

The ISDRA is located in southeastern California, in Imperial County, a county that extends over 4,597 square miles, bordering on Mexico to the south, Riverside County to the north, San Diego County on the west, and the State of Arizona on the east. Although lying in the desert east of the Peninsular Range of Southern California, the availability of irrigation water from the Colorado River has made possible a substantial agricultural economy in Imperial County. Approximately one-fifth of the land in the county is irrigated for agricultural purposes, while about half of county lands are largely undeveloped and under federal ownership. There are seven incorporated cities within Imperial County: Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial, and Westmorland. These incorporated cities, as well as the unincorporated communities and supporting facilities, occupy less than 1 percent of the land in the county.

The Imperial Sand Dunes, also referred to as the Algodones Dunes, extend from central Imperial County more than 40 miles into the southeastern portion of the county. The dunes and associated sand sheets generally form the eastern boundary of the agricultural area of Imperial Valley. The dunes themselves form a band averaging 5 miles in width. The ISDRA itself is roughly bordered on the west by the Coachella Canal, which delivers Colorado River water to the fertile agricultural valley to the north and west. A major east-west route of the UPRR skirts the eastern edge.

The dune system, extending from northwest to southeast, is crossed by two major east-west highways, near which recreational use traditionally has been concentrated. To the north, SR-78 crosses at the small settlement of Glamis, and connects Brawley (29 miles west of Glamis) with Blythe (60 miles northeast of Glamis). At the south end of the recreational area, I-8 crosses the dunes in the Buttercup Valley area. This highway provides access from El Centro and Southern California to the west, and from Yuma and the urban centers of Arizona to the east.

The ISDRA Plan Area includes not only the most of the sand dunes system, but also adjacent sand sheets to the west, and dissected distal alluvial fans to the east. Land use patterns (excluding recreational use) are less constrained than they are in the sand dunes themselves. These adjacent lands include the area east of Glamis along Ted Kipf Road and the UPRR to the east, and the East Mesa Area including the land between the Old Coachella Canal and the New Coachella Canal.

For management and reference purposes, the ISDRA has been generally divided into three areas. The northern-most area is known as Mammoth Wash. South of Mammoth Wash is the North Algodones Dunes Wilderness, which was established by the 1994 California Desert Protection Act. This area is closed to mechanized use and is accessible only by hiking and horseback. The largest and most heavily used area for OHV recreational



purposes is south of the wilderness, beginning at SR-78 and continuing south beyond I-8 to the border with Mexico.

### 3.5.2 Regulatory Framework

Plans and policies applicable to the management and ownership of any parcel or right-of-way depend upon the agency responsible for managing the lands involved. Primarily, the lands within the ISDRA are public lands managed by the BLM. The governing laws and applicable land management plans for these lands are the:

- Federal Land Policy and Management Act of 1976 (P.L. 94-579, as amended)
- California Desert Protection Act of 1994 (P.L. 103-433)
- BLM California Desert Conservation Area Plan of 1980, as amended

Lands under private ownership exist within and adjacent to the Plan Area boundary. Applicable land management plans and policies for these lands include:

- The Imperial County General Plan
- Imperial County Zoning Regulations

Two parcels of land owned by the California State Lands Commission (CSLC) lie within the ISDRA Plan Area. CSLC does not actively manage these parcels.

#### 3.5.2.1 Federal Land Policy and Management Act of 1976, As Amended

In 1976, Congress enacted the FLPMA and established the 25-million-acre CDCA. FLPMA was enacted to direct the management of the public lands of the United States, including the 12 million acres of public lands within the CDCA. Section 601 of FLPMA required BLM to develop a plan to “...provide for the immediate and future protection and administration of the public lands in the California Desert within the framework of a program of multiple use and sustained yield, and the maintenance of environmental quality.” The CDCA Plan, discussed in more detail below, was created to establish guidance for the management of the public lands of the California Desert by the BLM, including the ISDRA.

Congress, in Section 102(a)(7) of the Federal Land Policy and Management Act of 1976, declared that the public lands included in the Act were to be managed “on the basis of multiple use.” FLPMA defines multiple use as “...the management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and condition;...” The definition goes on to allow some areas to be managed for “...less than all the resources; a combination or balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources...” (Section 103(c)).



**3.5.2.2 California Desert Protection Act of 1994**

The CDPA established 69 wilderness areas located on BLM-managed public lands. In its findings for the CDPA, Congress declared that (1) wilderness is a distinguishing characteristic of the public lands in the California desert, (2) the wilderness values of desert lands are increasingly threatened by activities and intrusions associated with incompatible use and development, and (3) the preservation of desert wilderness requires the highest forms of protective designation and management. The CDPA established the North Algodones Dunes Wilderness, located in the northern portion of the ISDRA Plan Area, beginning just north of SR-78, and ending just at the Mammoth Management Area (see Figure 1-2). This enhanced the multiple-use aspect of the ISDRA by assuring primitive, nonmotorized recreational experiences would be available along with motorized recreational activities in other parts of the ISDRA.

**3.5.2.3 California Desert Conservation Area Plan**

The CDCA Plan is a comprehensive, long-range plan for the use and management of the 12 million acres of public land within the boundaries of the California Desert Conservation Area. The CDCA Plan was adopted in 1980, and subsequently has been amended on a periodic basis. The goal of the CDCA Plan is to provide and enhance uses for public lands without diminishing the environmental, cultural, and aesthetic values of these lands (BLM, 1980).

The ISDRA is located entirely within the CDCA. The majority of the public lands within the CDCA has been designated under a multiple-use classification system. The CDCA Multiple-Use Classes are discussed in Section 3.1 and illustrated in Figure 3.1-1.

All four MUCs are represented within the ISDRA. The North Algodones Dunes Wilderness is located within lands designated Class C. The CDCA Plan assigned much of the central dunes and Pilot Knob Mesa on the eastern edge of the dunes to Class L, to protect sensitive plant and wildlife habitat. East Mesa south of SR-78, the area east of Glamis, and South Ogilby Dunes were placed in Class M. Class I areas within the ISDRA include the intensively used OHV activity areas such as those near Glamis, along the Gecko Road, and Buttercup Valley. The management objective of these areas is to enhance opportunities for OHV recreation.

In addition to MUCs, the CDCA also designated ACECs, areas where special management attention is required to protect and prevent damage to important natural and cultural resources. At the ISDRA, these include Plank Road ACEC and the East Mesa ACEC near Gordons Well. The former was designated an ACEC to protect this historic resource, and the latter was designated to ACEC to protect habitat of the flat-tailed horned lizard.

**3.5.2.4 Imperial County General Plan and Zoning Regulations**

As Imperial County has no direct land use jurisdiction over public lands, neither the General Plan nor the Imperial County zoning regulations are directly applicable to activities proposed on public lands. However, private lands scattered throughout and adjacent to the Plan Area are under the jurisdiction of Imperial County.



The state-mandated Imperial County General Plan (General Plan) was developed to create a balanced, comprehensive guide for future physical growth of lands within the county, and to provide mechanisms to achieve the desired goals and objectives of the county. The General Plan strives towards achieving a balance between development and economic, social, and environmental resources. The General Plan consists of nine elements: Land Use, Housing, Circulation and Scenic Highways, Noise, Seismic and Public Safety, Agriculture, Conservation and Open Space, Geothermal and Transmission Resources, and Water Resources (Imperial County, 1993).

A land use map that depicts existing and projected land use development patterns within Imperial County is provided as part of the Land Use Element of the General Plan (Land Use Plan). The Land Use Plan indicates that the ISDRA and vicinity, including both public- and privately-owned lands, are located within a larger area currently zoned "S-2, Open Space Preservation," with the exception of some small, scattered parcels of land zoned S-1 (Open Space Recreation) or C1-PE (Neighborhood Commercial, Pre-existing). The Conservation and Open Space Element of the Plan is concerned with open space and other environmental resources. The purpose of the Conservation and Open Space Element of the General Plan is to:

- Promote the protection, maintenance, and natural resources of the county with particular emphasis on scarce resources and resources that require special control and management
- Prevent the wasteful exploitation, destruction, and neglect of the natural resources of the state
- Recognize that natural resources must be maintained for their ecological value as well as for the direct benefit to the public
- Protect open space for the preservation of natural resources, the managed production of resources, outdoor recreation, and public health and safety

The General Plan provides for the preparation and adoption of specific plans as "planning tools" to implement the general plan for further studies as needed prior to development. Two specific plan areas are in the immediate vicinity of the ISDRA. The boundaries of the 8,960-acre Felicity Specific Plan Area approach the ISDRA from the west. This Plan Area is intended to be developed with a full range of residential, commercial, and light industrial uses in a manner compatible with the natural setting of the site and its visibility from I-8. The Felicity Specific Plan is currently in litigation and has not been approved (Imperial County, 2001a). The Glamis Specific Plan Area is approximately 160 acres and is located just inside the eastern boundary of the ISDRA at SR-78. The Glamis Specific Plan Area is intended to accommodate recreation-supporting land uses including retail and service commercial, motel accommodations, recreational vehicle and mobile-home parks, and community facilities. Except as needed for onsite employees, the Glamis Specific Plan does not include use areas for permanent occupancy.



### 3.5.3 Land Ownership and Rights-of-Way

A mixed ownership pattern, with public land managed by the BLM comprising most of the land, exists within the ISDRA planning area (Figure 3.5-1). In addition to a limited number of parcels in private ownership as well as lands withdrawn for other federal use (such as that by the Department of Defense or the Bureau of Reclamation), under FLPMA the BLM has granted a number of rights-of-way for facilities within the ISDRA (Table 3.5-1).

**Table 3.5-1 Rights-of-Way And Other Entitlements Within The ISDRA Planning Area**

<b>MAMMOTH MANAGEMENT AREA</b>	
1. Cathodic Protection Unit Site R/W (LA 0158160)	
2. BLM Windmill and Wildlife Water Tank Sites (2) R/W (CA-8714)	
<b>NORTH ALGODONES MANAGEMENT AREA</b>	
1. BLM Windmill and Wildlife Water Tank Site R/W (CA-8714)	
2. State Route 78 R/W (CA-14630)	
3. Military Target Area (R 05657)	
<b>GECKO MANAGEMENT AREA</b>	
1. Military Target Area (R 05657)	
2. Old Coachella Canal R/W (LA 056654)	
3. Withdrawal Yuma Reclamation Project - New (Realigned) Coachella Canal	
4. BLM (Gecko Road) Easement (CA-2551)	
5. Glamis Known Geothermal Resource Area (CA-17575)	
6. Fiber Optic Line (AT&T) R/W (CA-41690)	
7. Underground Telephone Line R/W (CA-19125)	
8. Temporary Use Permits for Apiary Sites along Coachella Canal	
9. WSA CDCA 362 - South Algodones Dunes	
<b>GLAMIS MANAGEMENT AREA</b>	
1. Underground Telephone Line R/W (CA-19125)	
2. Road R/W (CA-40791)	
3. State Route 78 (Realigned portion) R/W (CA-17922)	
4. Fiber Optic Line (AT&T) R/W (CA-41690)	
<b>ADAPTIVE MANAGEMENT AREA</b>	
1. Military Target Area (R 05657)	
2. Cathodic Protection Unit Site R/W (LA 0158161)	
3. Glamis Known Geothermal Resource Area (CA-17572)	
4. WSA CDCA 362 - South Algodones Dunes	
<b>DUNE BUGGY FLATS MANAGEMENT AREA</b>	
1. All American Canal R/W (LA 077775)	
2. Proposed Withdrawal, All American Canal Lining Project (CA-34475)	
3. Old Coachella Canal R/W (LA 056654)	
4. Withdrawal Yuma Reclamation Project - New (Realigned) Coachella Canal	
5. Military Target Area (R 05657)	
6. Temporary Use Permits for Apiary Sites along Coachella Canal	



**Table 3.5-1 Rights-of-Way And Other Entitlements Within The ISDRA Planning Area**

<b>OGILBY MANAGEMENT AREA</b>	
1.	Interstate 8 Highway R/W (LA 0165008)
2.	State Highway (Grays Well Overpass) R/W (CA-17911)
3.	Transmission Line R/W (LA 055613)
4.	Transmission Line R/W (CA-5865)
5.	County Road (Ogilby) R/W (CA-19171)
6.	Communication Site, Access Road and Transmission Line R/W (CA-17182)
7.	Railroad R/W (east boundary of management area)
8.	All American Canal and Well Sites R/W (LA 077775)
9.	Proposed Withdrawal, All American Canal Lining Project (CA-34475)
<b>BUTTERCUP MANAGEMENT AREA</b>	
1.	Utility Corridor J (2 miles wide)
2.	All American Canal and Associated Telephone and Transmission Line R/W (LA 077775)
3.	Transmission Line R/W (CA-5865)
4.	Transmission Line R/W (CA-18904)
5.	Transmission Line R/W (LA 055165)
6.	Transmission Line R/W (LA 0164553)
7.	Powerline Extension (to All American Canal) R/W (CA-35934)
8.	Underground Telephone Line R/W (CA-26357)
9.	Underground Fiber Optic Line (Level 3) R/W (CA-41192)
10.	Barrier (U.S. Border Patrol) R/W Reservation (CA-34052)
11.	Road (Grays Well Road) R/W Reservation to BLM (CA-19131)
12.	Interstate 8 Highway R/W (LA 0165008)
13.	State Highway (Grays Well Overpass) R/W (CA-17911)
14.	Interstate 8 Highway and Ancillary Facilities R/W (R 07237)
15.	Interstate 8 Highway and Ancillary Facilities R/W (R 01737)
16.	Proposed Withdrawal, All American Canal Lining Project (CA-34475)
<b>BUFFER MANAGEMENT AREA</b>	
1.	Strip of Land Acquired by and Under Jurisdiction of BOR (CA-19902)
2.	Old Coachella Canal R/W (LA 056654)
3.	Underground Fiber Optic Line (AT&T) R/W (CA-41690)
4.	Cathodic Protection Unit Site R/W (LA 0158162)
5.	State Route 78 (Realigned Portion) R/W (CA-17922)
6.	Railroad Spur R/W (CA-29617)
7.	Mineral Material Site (LA 0164722)
8.	Cathodic Protection Unit Site R/W (R-374)
9.	Easement to U.S. for Gordons Well Road (CA-37234)
10.	Barrier (U.S. Border Patrol) R/W Reservation (CA-34052)
11.	County Road (Old Hwy. 80) R/W (R 01737)
12.	Underground Telephone Line R/W (CA-26357)
13.	Road R/W (LA 0165008)



**Table 3.5-1 Rights-of-Way And Other Entitlements Within The ISDRA Planning Area**

14. All American Canal, Telephone Line R/W (LA 077775)
15. Transmission Line R/W (LA 055165)
16. Transmission Line R/W (LA 164553)
17. County Road (Old Hwy. 80) R/W (R 01737)
18. Road, Pipeline, Wells, Transmission Line (CA-21618)
19. Mineral Material Site (LA 0133909)
20. RS 2477 County Road (Vista Mine Road and Zappone Road) R/W (CA-19169)
21. State Highway (Portion of Hwy. 78) R/W (CA-14630)
22. Underground Telephone Line R/W (CA-19125)
23. Road R/W (CA-8503)
24. Road R/W (CA-40791)
25. All American Canal R/W (LA 077775)
26. Seismographic Monitoring Site R/W (CA-2953-22)
27. Transmission Line R/W (CA-5865)
28. Underground Fiber Optic Line (Level 3) R/W (CA-41192)
29. State Highway R/W (R 137)
30. Surveillance Camera and Access Road (U.S. Border Patrol) R/W Reservation (CA-40000)
31. Telephone Line and Road R/W (CA-18904)
32. Temporary Use Permits for Apiary Sites along Coachella Canal

R/W – Right-of-way

As with other BLM-administered lands, rights-of-way and temporary use permits within the ISDRA are normally granted subject to other valid, pre-existing rights including the right of entry unless specifically prohibited. Rights-of-way, temporary use permits, and other similar entitlements are normally not granted if the use for which the right of way is intended would conflict with a valid pre-existing use. Thus, OHV recreational activities still occur on utility rights-of-way within the ISDRA. Entry into lands that have been withdrawn or reserved, on the other hand, is normally precluded for purposes other than those intended for the withdrawal or reservation. Hence, public entry is prohibited in the military areas noted above.

While most Bureau of Reclamation (BOR)-withdrawn lands have been relinquished within the ISDRA, some of the lands around the U.S. Navy East Mesa Target Area and between the Old and New Coachella Canals remain withdrawn. Under terms of a 1978 agreement, BLM has recreation management responsibility for these lands but must obtain BOR concurrence on all management actions. In addition, BOR retains a withdrawal on the rights-of-way of the new Coachella Canal and All-American Canal (1,000 feet on either side of the canal centerline). BOR must approve BLM management programs initiated within the canal rights-of-way. BOR programs are the paramount use on all BOR-withdrawn lands.



### 3.5.4 Existing Land Uses

Existing land uses at the ISDRA are primarily recreational, although agricultural, transportation, communication, military, and other uses also occur. Multiple-use classes, as defined in the CDCA Plan (see above), are used to guide land use in the ISDRA; those uses are discussed below. The CDCA Plan also identifies certain areas within the ISDRA as open, limited, or closed to OHV use. Detailed discussions of existing recreational uses in the ISDRA, including OHV uses and camping, are provided in Section 3.1 (Recreational Resources).

#### 3.5.4.1 Recreational Use And Multiple-Use Classes Within the ISDRA

Lands located within the ISDRA have been assigned to an MUC that defines permitted uses on those lands. Land uses currently occurring within each MUC are described below and are primarily recreation based. Areas with restricted vehicle use or that are open or closed to OHV use are discussed as they occur within each MUC.

##### **Class C**

Lands identified as Class C make up the 32,000-acre North Algodones Dunes Wilderness, as created by Congress through the California Desert Protection Act of 1994. Solitude and primitive recreation are the primary land uses within the wilderness. Primitive camping is allowed, but developed camping sites or facilities are not available. No commercial uses are permitted, and the use of motorized vehicles of any kind is prohibited.

Most use in the wilderness takes the form of short photographic and sightseeing walks from SR-78, although hiking, backpacking, and nature study trips also occur. The wilderness is closed to OHV use (see Figure 3.1-2).

##### **Class L**

Lands identified as Class L (Limited Use) make up most of the southern half of the ISDRA, including much of the central dunes and Pilot Knob Mesa. Limited Use lands are intended to protect sensitive natural, scenic, ecological, and cultural resource values. This class is suitable for recreation that generally involves low to moderate user densities. Developed campgrounds or sites involving concentrated recreational use are generally not allowed in this class. Most of the central dunes Class L area is lightly used, with use consisting primarily of OHV day use with little camping. However, the Ogilby Camp Area is located in Class L lands in the southeastern portion of the ISDRA.

##### **Class M**

Class M (Moderate Use) lands are located along the eastern and southern boundaries of the ISDRA and west of Glamis along SR-78. These lands are intended to provide for a balance between higher intensity use and protection of public lands. Recreational use is appropriate at moderate to high densities, and developed recreation sites are permitted. The Class M lands east of Glamis are currently closed to camping. OHV use on Class M lands is limited to approved routes of travel.

##### **Class I**

Class I (Intensive Use) lands provide for the concentrated use of lands and resources to meet human needs. Recreation activities involving high densities



are permitted. Areas of the dunes assigned to Class I include the intensively used OHV areas around Glamis, Buttercup Valley, and Mammoth Wash. The management objective of these areas is to enhance opportunities for OHV recreation. Campgrounds and other facilities are permitted.

High-density camping and OHV uses occur in Class I. Many established campgrounds are located along SR-78, Gecko Road, and I-8. These campgrounds are used primarily by those participating in OHV activities on Class I lands. The Class I lands immediately south of SR-78 are the most intensively used. Also intensively used is the Buttercup Valley Class I area, which is located just north and south of I-8. The Class I area near Mammoth Wash at the north end of the ISDRA receives only light-to-moderate use, owing largely to difficulty in accessing it.

### **3.5.3.2 Nonrecreational Land Uses**

Some BLM-managed land within the ISDRA has not been assigned an MUC. These lands are located along the east side of the ISDRA and parallel the UPRR, as well as additional lands east and north of Glamis. Generally, they were recognized in the CDCA Plan to be lands that may be put to some use other than recreation in the future. The land paralleling the UPRR is designated by the CDCA Plan as a contingency utility corridor, while the land in the vicinity of Glamis may accommodate activities and uses associated with the settlement of Glamis.

In addition to the extensive recreation-based uses that take place within the ISDRA, a wide variety of nonrecreational uses takes place within or immediately adjacent to the ISDRA.

#### **Agricultural Uses**

BOR-withdrawn lands within the ISDRA include those between the Old Coachella Canal the New Coachella Canals. In addition, BOR has maintenance and management responsibility for the New Coachella Canal and the All-American Canal. In addition to the canals, which are critical to supporting the agricultural industry of the Imperial Valley, a number of temporary use permits have been granted for apiaries.

#### **Military**

Current Department of Defense activities within the ISDRA focus on over flights to and from the military training areas to the east of the ISDRA, and use of lands in the vicinity of several target areas (Figure 3.5-1). The U.S. Navy and BLM have developed a Cooperative Agreement for management of public lands in range safety zones surrounding Navy Targets 68 and 95 on East Mesa. A Desert Plan amendment necessary to implement the agreement was proposed in 1985. The amendment would close East Mesa lands between Target 68 and the old Coachella Canal to OHV use. Under terms of the Cooperative Agreement, the Navy will review all proposed management actions within Range Safety Zone C, which includes the Gecko Management Area and much of the North Algodones Dunes Wilderness, to ensure conformity with structural height restrictions and other guidelines to safeguard aircraft operations near the targets.



### **Mining and Quarrying**

Mineral materials removal within the ISDRA is restricted to sand and gravel quarrying, and is found to the east of the dunes in the Pilot Knob Mesa area. Free-use and sales permits have been issued. These uses and resources are discussed in greater detail Section 3.13, Geology, Energy, and Mineral Resources.

### **Energy Production**

The northern half of the ISDRA is closed to all geothermal leasing. The dunes south of the Glamis/Gecko Open Area are open to leasing subject to a no surface occupancy stipulation. All areas outside the dunes proper are open to leasing with appropriate mitigation. Although such activities take place elsewhere in the vicinity of the ISDRA, no geothermal leases have been issued; and no development has taken place within the ISDRA. No development of oil or gas resources has occurred within the ISDRA. These resources are discussed in Section 3.13, Geology, Energy, and Mineral Resources.

### **Utilities and Transportation**

Two major road rights-of-way (SR-78 and I-8) cross the recreation area in an east-west direction, while the UPRR runs northwest to southeast in the eastern ISDRA. The two roads provide the chief access to the ISDRA. A major utility corridor within the recreation area passes through the Buttercup Valley Open Area parallel to I-8. Existing facilities include a 500-kilovolt (kV) transmission line and a number of smaller power and telephone lines. Transmission lines also parallel the Coachella Canal and the UPRR. A high-pressure gas pipeline is located within the railroad right-of-way, and a microwave relay tower is located west of Ogilby.

### **Commercial and Residential Uses**

Commercial land uses within the ISDRA are restricted to those at the Glamis Store, and the activities of concessionaires in locations and at times authorized by the BLM. Most of these concessions are restricted to high-use periods, chiefly the holidays during the inter half-year, when the population of OHV enthusiasts in the ISDRA swells. No permanent, residential land use occurs on BLM managed lands within the ISDRA. That occurring on private lands is restricted to the residence for the store owners at Glamis.



## 3.6 VISUAL RESOURCES

### 3.6.1 Introduction

Visual resources are managed by controlling how the landscape is altered from the natural appearance, and by introducing or maintaining variety into the “seen” area. Visual variety contributes to high-quality recreation experiences. Visual variety at the ISDRA is evidenced by contrasts in the ever-changing sand dunes and vegetation. Most of the landscape appears natural (undisturbed) with very few human-made landscape alterations. Many opportunities exist for undisturbed views that have little human intervention. The composition of the dune formations, fine textures, and color contrast between the darker vegetation and light sand is what gives the ISDRA its distinctive landscape character.

Provided below is a discussion of the regulatory framework of the BLM and a description of the visual resources of the ISDRA.

### 3.6.2 Regulatory Framework

The BLM has developed a system (the Visual Resource Management [VRM] Program) for evaluating the visual resources of a given area to determine what degree of protection, rehabilitation, or enhancement is desirable and possible. The BLM is concerned with managing visual resources equally with other resources and attaining acceptable levels of visual impact without unduly reducing commodity production or limiting overall program effectiveness.

The purpose of the VRM Program’s is twofold: (1) to manage the quality of the visual environment and (2) to reduce the visual impact of development activities, while maintaining effectiveness in its resource programs. Managing the visual aspects of changes to the natural landscape is particularly important for the BLM because most activities taking place on BLM lands involve some degree of alteration.

Perception of visual quality in a landscape is based on several common principles:

- Landscape character is determined by four basic visual elements (form, line, color, and texture), which are present in every landscape and exert varying degrees of influence.
- The stronger the influence exerted by these elements, the more interesting the landscape.
- The more visual variety in a landscape, the more aesthetically pleasing the landscape. Variety in the landscape with harmony is considered attractive; landscape alterations that create disharmony are considered unattractive (BLM, 1980).

The BLM has not inventoried the lands within the ISDRA, nor has it given those lands relative visual ratings (Management Classifications), according to the VRM Program. There are five Visual Resource Management Classes (VRM Classes) to describe the different degrees of modification allowed to the basic elements of the landscape. These are briefly described below:



- Class 1: Natural ecological changes and very limited management activity area allowed. Any contrast created within the characteristic landscape must not attract attention. This classification is applied to wilderness areas, wild and scenic rivers, and other similar situations.
- Class 2: Changes in any of the basic elements (form, line, color, texture) caused by a management activity should not be evident in the characteristic landscape. Contrasts are seen, but must not attract attention.
- Class 3: Contrasts to the basic elements caused by a management activity are evident, but should remain subordinate to the existing landscape.
- Class 4: Any contrast attracts attention and is a dominant feature of the landscape in terms of scale; but it should repeat the form, line, color, and texture of the characteristic landscape.
- Class 5: The classification is applied to areas where the natural character of the landscape has been disturbed to a point where rehabilitation is needed to bring it up to one of the four other classifications. The classification also applies to areas where there is potential to increase visual quality of the landscape. It would be applied, for example, to areas where unacceptable cultural modification has lowered scenic quality; it is often used as an interim classification until objectives of another class can be reached.

The BLM currently manages the lands within the ISDRA according to the Multiple-Use Classes listed in the California Desert Conservation Area Plan. The CDCA Multiple-Use Classes are discussed in Section 3.1 and illustrated in Figure 3.1-1.

The VRM Classes that are associated with these Multiple-Use Classes are listed in Table 3.6-1.

**Table 3.6-1 VRM Classes Associated with the Multiple-Use Classes Assigned to the Imperial Sand Dunes Recreation Area**

ASSIGNED MULTIPLE-USE CLASS <sup>A</sup>	ASSOCIATED VRM CLASS
Class I Intensive Use	VRM Class 4
Class M Moderate Use	VRM Class 3
Class L Limited Use	VRM Class 2
Class C Controlled Use	VRM Class 1

VRM Class 5 was not assigned to any of the Multiple-Use Classes because none of the lands in the ISDRA have been degraded to the point where they require rehabilitation.

Figure 3.6-1 depicts the VRM Classes associated with the Multiple-Use Classes that are assigned to ISDRA lands. As shown in Figure 3.6-1, the popular dune areas and campgrounds within the ISDRA also can be categorized according VRM Classes, as listed in Table 3.6-2.



Table 3.6-2 Visual Resource Management Classes of OHV Use and Camping Areas

VISUAL RESOURCE MANAGEMENT CLASSES			
CLASS 1	CLASS 2	CLASS 3	CLASS 4
North Algodones Dunes Wilderness	Ogilby Camp Area	Area along the New Coachella Canal that includes the Sand Highway	Gecko Campground
	Patton Valley	Area south of SR-78 that is east of Ted Kipf Road	Roadrunner Campground
	China Wall Hill #5		Keyhole Campground
	Buffer Zone		Buttercup Campground
			Midway Campground
			Grays Well Camping
			Glamis Flats
			The Washes
			Garbage Flats
			Osborne Lookout
			Wildlife Viewing Area within the North Algodones Dunes Wilderness
			Brawley Slide Hill
			Oldsmobile Hill
			Competition Hill
			Test Hill
			Dune Buggy Flats
			Plank Road

### 3.6.3 Existing Visual Resources

The following description of the visual resources of the landscape at various areas within the ISDRA is based on a site visit conducted on October 16 and 17, 2001. The climatic conditions during the site visit included cloudy skies, no wind, and temperatures estimated to be in the 90s (°F). The ISDRA is a mostly undeveloped area consisting of sand dunes ranging in elevation from approximately 100 to 640 feet, depending on location within the dunes. The differing shapes of the dune forms add interest to the landscape. The homogeneous sand color and the fine sand texture provide a strong contrast to



the blue sky and add visual interest to the view. Certain dunes, such as Competition Hill, have horizontal ridges across the dune hills. These ridges are known as “whoop-de-do’s.” They add texture to the visual landscape as do the vehicle tire tracks on the dunes.

The dunes present a spectacular landscape. From the interior of the dunes, views in all directions are of dunes that are smooth, rounded hills of fine-textured, light-colored sand. Most of the dunes are devoid of vegetation. The unvegetated dunes do not provide much variety in view, but present an interesting one that is enhanced by the stark contrast of the dunes against the blue, clouded sky. The dunes that have low-lying shrub vegetation scattered across them also provide visual interest due to the contrast in texture and color provided by the vegetation and the color contrast provided by the sky. The dunes are of varying sizes, heights, and shapes due to winds blowing the sand and OHV use patterns. The closed areas and the wilderness area appear pristine, with no vehicle tracks visible. Most of the ISDRA lacks human-made development.

Development within the ISDRA includes the Cahuilla Ranger Station, the two vendor concessionaire areas, the Glamis Beach Store, and the development at certain campgrounds. Other human-made development is concentrated at or near the boundaries of the ISDRA recreational management area boundary. This includes the UPRR tracks and pipeline aboveground markers that exist along the eastern boundary of the recreation management area, the overhead electric distribution line, and the New Coachella Canal that exists along the western edge. SR-78 is the major easterly trending two-lane road that crosses the ISDRA at the southern edge of the North Algodones Dunes Wilderness. I-8 also is an easterly trending roadway near the southern edge of the ISDRA, and the All American Canal parallels I-8 on its north side. High-voltage electric transmission line development also occurs in the southern area and a communications tower exists near the Ogilby Camp Area. This development near the ISDRA boundaries reflects the character of a more urban developed area.

The ISDRA is open year-round; however, due to high summer temperatures, use tends to occur from October through Easter of each year. In addition, use on weekdays is minimal, and use on most weekends is moderate. The peak season is concentrated into six holidays: Halloween, Thanksgiving weekend, New Years, Martin Luther King Day, President’s Day, and Easter break (which lasts a few weeks due to the differing “spring breaks” offered by various schools).

Although OHV use occurs throughout the open areas of the ISDRA, certain areas receive higher levels of use, such as Osborne Lookout, Competition Hill, Oldsmobile Hill, Brawley Slide Hill, Patton Valley, Test Hill, and Plank Road. During the mid-week site visit, only a few recreationists were present at these locations. Views of these areas revealed large open expanses of land (sand dunes and the flat open, sandy areas). The areas appeared relatively pristine, lacking both much human-made development and signs of heavy



recreation use. Vehicle tire tracks and boundary posts were the only signs of use/development across the dunes. The high use that occurs at these areas at peak times reflects the BLM's VRM Class 4 management of these areas.

Mammoth Wash, at the northern end of the ISDRA, receives minor use due to its remoteness. This area has dunes that are smaller than the areas further south, so less OHV opportunity exists there. This northern area has private land interspersed with BLM land. Grapefruit orchards abut the dunes, which adds color, texture, line, and form variety to the dune landscape.

OHV users intent on camping concentrate use at the Gecko Campground, Keyhole Campground, Roadrunner Campground, The Washes, Ogilby Camp Area, Buttercup Campground, and Midway Campground. During the site visit, these camp areas appeared to be vacant, vast expanses of level sand, some of which had restroom buildings and trash dumpsters, but no other development visible. These areas also appeared relatively pristine, except for the restroom and trash facilities and the signage that exists at certain areas. Photographs of these areas during peak-use weekends show these areas overflowing with recreational vehicles, OHVs, camping equipment, and recreationists, which result in a strong visual contrast to what was seen during the site visit. Review of these photographs provides a more accurate picture of the intensive use that occurs within these VRM Class 4 areas.

The Cahuilla Ranger Station, located just south of SR-78 on Gecko Road, consists of a small building and fenced equipment/vehicle storage yard. Also on Gecko Road is a vendor concessionaire area. At the time of the site visit, it was mostly vacant. One vendor, who stays there year-round, was present. The presence of vendors in this area during the peak use times of the year reflects a human-made character that strongly contrasts with the natural, undeveloped character of the dunes.

Osborne Lookout is located approximately 3 miles east of the Cahuilla Ranger Station on the south side of SR-78. It consists of a gravel parking area where camping is allowed at the southern end and day use viewing is allowed at the northern end of the area. Views to the east from the lookout are of rolling dunes in the foreground and middleground, and of the Black Mountains in the background. To the north is the North Algodones Dunes Wilderness in the foreground and the Chocolate Mountains in the distance. Views to the west and south are of the dunes.

The microphyll woodland area, located to the east of Oldsmobile Hill, is heavily vegetated due to flash floods that occur there. The abundance and type of vegetation present in this area is not characteristic of much of the ISDRA. This area exhibits much color and texture that is not seen in other areas of the ISDRA.

The Wildlife Viewing Area, within the North Algodones Dunes Wilderness, is the only interpretive area away from the Cahuilla Ranger Station. The viewing area includes explanatory wildlife and habitat information on



interpretive boards. Motorized vehicle use is not allowed or evident away from the viewing area because this area is within the wilderness area.

The Plank Road area provides a historic view of a wood plank road constructed in the early 1900s to allow motorists to cross the desert. Fragments of the Plank Road remain, and a small area of a replica of the Plank Road has also been constructed to show the public how the historic road once appeared. Interpretive information is also displayed at the partially fenced Plank Road area.

Two different types of Border Patrol barriers exist along I-8 on its south side to the west of the Buttercup Campground. The purpose of these barriers is to exclude illegal aliens from entering the United States from Mexico. These barriers provide varying levels of effectiveness. The barriers are painted white with red accents. Their form, color, and line contrast with the undisturbed desert landscape; however, this area is also a utility corridor that includes several high-voltage electric towers of varying designs.

To the east of the ISDRA and the buffer zone, is the Mesquite Mine (located to the east of the UPRR tracks). The mine includes the Mesquite Mine Overlook Trail, a 3-mile-long gravel trail that climbs a hill. It provides benches for resting, interpretive displays along the trail, and wheelchair access for the first portion of the trail. Views from the Mesquite Mine Overlook include the sand dunes, the mining area, and tailings. To the southwest, there is an unobstructed view of Oldsmobile Hill from this location.

Views from Ted Kipf Road traveling southeast from The Washes toward Ogilby Road include visible mining scars in the Cargo Muchacho Mountains to the east.



## 3.7 WATER RESOURCES

The Imperial Sand Dunes Recreation Area is located in the desert southeastern California, an area marked by long, hot summers and meager rainfall. Surface water in the extended vicinity of the ISDRA includes the Salton Sea, the Colorado River, and the Gulf of California. Other than canals that carry Colorado River water to the Imperial Valley, water resources in the immediate vicinity of the ISDRA are quite limited.

### 3.7.1 Surface Waters

There are two primary surface waterways in the vicinity of the ISDRA, the All American Canal and the New Coachella Canal.

#### 3.7.1.1 All American Canal

All-American Canal is approximately 80 miles long and is part of the federal irrigation system of the Hoover Dam. The canal was built between 1934 and 1940 across the Colorado Desert and is entirely within the United States. Water is diverted from the Colorado River into the canal at the Imperial Dam. Flow proceeds in a westerly direction, and smaller distributary canals carry water from it into the Imperial Valley and Coachella Valley. This canal system irrigates more than 600,000 acres in the Imperial and Coachella agricultural region, and has greatly increased crop yield in the area.

The All American Canal has a bottom width of approximately 160 feet and depth of about 21 feet. The canal is lined with clay to minimize seepage. The capacity of the canal is 10,155 cubic feet per second (cfs) in the vicinity of the ISDRA. Although the All American Canal is lined, a substantial amount of water is believed to be lost through seepage.

The USACE, under Section 404 of the Clean Water Act, regulates the discharge of dredged or fill material into "waters of the United States" (33 USC 1251-1376). Permits must be obtained from the USACE prior to initiating discharges into jurisdictional "waters of the United States." "Waters of the United States" includes all waters that are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters that are subject to the ebb and flow of the tide; and tributaries of these waters (33 CFR 328.3). Because the All American Canal is tributary to the Colorado River, it is considered a water of the U.S. and within the jurisdiction of the USACE.

#### 3.7.1.2 Coachella Canal

The New Coachella Canal is connected to the All American Canal at what is known as Drop 1 in the southern ISDRA near I-8 (see Figure 1-2). The Coachella Canal originally was completed in 1949 as an unlined channel and had a flow capacity of approximately 2,500 cfs. The canal extends northwesterly from Drop 1 (All American Canal) for approximately 123 miles and runs along the east side of the Salton Sea and west of the Plan Area. The first 48 miles of the Old Coachella Canal were replaced with a new canal called the New Coachella Canal in the early 1980s due to concerns about water loss through seepage in the East Mesa area. The Old Coachella Canal is no longer used to transport water.



The 48-mile New Coachella Canal has a flow capacity of approximately 1,550 cfs and is concrete lined to prevent seepage. Operating roads are located along either side of the newer canal. The New Coachella Canal has a bottom width of approximately 16 feet and ranges in depth from 10 to 12 feet. It runs northeast through the proposed Dune Buggy and Gecko Management Areas, and also provides a feature used to delimit the borders between the proposed Boundary Zone Management Area to the west, and the proposed management areas to the east (see Figure 1-2).

Because the New Coachella Canal is tributary to the All American Canal and the Colorado River, it is considered a water of the U.S. and within the jurisdiction of the USACE.

### 3.7.2 Wildlife Guzzlers

Seepage along the Old Coachella Canal resulted in a greenbelt and pools along the canal that supported various forms of wildlife. With construction and operation of the New Coachella Canal and the subsequent retirement of the southern portion of the Old Coachella Canal, wildlife dependent on the greenbelt and pools no longer had a water source. To partially mitigate the loss of this wetland habitat, the CDFG installed four windmill wells in the proposed North Algodones Dunes Wilderness Management Area and two windmill wells in the proposed Mammoth Management Area to the north. More recently the windmills were replaced by solar panels and electric pumps. The wildlife guzzlers have created limited wetland and green areas within the northern portion of the ISDRA that provide vegetation and water for wildlife.

### 3.7.3 Ephemeral Surface Flows

Numerous washes that carry storm runoff exist within the ISDRA. These are particularly evident as generally east to west flowing channels that have incised the distal alluvial fans of the Chocolate Mountains and the Cargo Muchacho Mountains in the eastern portion of the ISDRA. Ephemeral surface flows and pools form in the washes and low points in the eastern transition areas as a result of infrequent runoff events caused by cloudbursts in the nearby mountains. The ephemeral surface flows and pools most commonly occur in the springtime of wet years, but can also occur at other times. The pools do not remain for long periods following rains due to the permeable nature of the soils in this area.

### 3.7.4 Groundwater

The ISDRA is located within what recently has been termed the Amos-Ogilby-East Mesa groundwater basin (RWQCB, 2001). The basin is a northwesterly trending, elongated area of approximately 860 square miles within the southeastern portion of Imperial County, California, generally following the alignment of the trough of the Gulf of California north to the Salton Sink. It is bounded on the east by the Chocolate and Cargo Muchacho Mountains, on the north by the surface drainage/groundwater divide that separates the Amos Basin from the East Salton Sea Basin, on the west by the fine-grained, less permeable sediments of the central Imperial Valley, and to the south by the arbitrary political boundary with Mexico. The alluvial sediments that make up the water-bearing aquifer range in thickness from 0 feet on the eastern boundary at the Chocolate Mountains to as much as 10,000 feet at the western boundary of the basin in the Imperial Valley. Depth



to groundwater in the ISDRA is estimated to be several hundred feet below ground surface.

### 3.7.5 Beneficial Use Designations

The ISDRA is located in the Colorado River Basin within the jurisdiction of the Regional Water Quality Control Board District 7 (RWQCB7). The Colorado River Basin includes all of Imperial County and portions of San Bernardino, Riverside, and San Diego Counties. The RWQCB7 approved the *Basin Plan for the Colorado River Basin* in 1993; and this plan established beneficial use designations for the All American Canal, Coachella Canal, and the Amos-Ogilby hydrologic unit. The beneficial uses of these water sources are presented in Table 3.7-1, and a key to the use categories is presented in Table 3.7-2.

**Table 3.7-1 Beneficial Use Designations**

WATER BODY / UNIT	MUN	AGR	AQUA	FRSH	IND	GWR	REC I	REC II	WARM	WILD	POW	RARE
All American Canal	X	X	X	X	X	X	X	X	X	X	X	X
Coachella Canal	P	X				X	X	X	X	X		X
Amos-Ogilby Unit	X											

Source: 1993 *Basin Plan for the Colorado River Basin*.

X = Existing beneficial use. P = Potential beneficial use.

**Table 3.7-2 Explanation of Beneficial Use Categories**

CATEGORY	EXPLANATION
MUN	Municipal and Domestic Supply
AGR	Agricultural Supply
AQUA	Aquaculture
IND	Industrial Service Supply
GWR	Groundwater Recharge
REC I	Water Contact Recreation
REC II	Noncontact Recreation
WARM	Warm Freshwater Habitat
WILD	Wildlife Habitat
POW	Hydropower Generation
FRSH	Freshwater Replenishment
RARE	Preservation of Rare, Threatened, or Endangered Species

Source: 1993 Basin Plan – Colorado River Basin.



### 3.8 CULTURAL RESOURCES

#### 3.8.1 Overview

Although an arid area, the ISDRA contains evidence of human activity from prehistoric times to the present. The eastern desert of Imperial County has served as a transportation corridor, with the Algodones dune fields encouraging most travelers to seek routes to the north or south of the Plan Area until the early 20<sup>th</sup> century.

#### 3.8.1.1 Prehistory

The ISDRA was utilized prehistorically by a variety of Native American groups, including the Yuman-speaking Quechan and Kumeyaay (Kamia) and (possibly) the Takic-speaking Cahuilla. The extreme aridity of the dunes suggests that permanent habitation sites probably do not exist there; but temporary camps, resource acquisition and processing sites, and travel corridors are known to occur, especially around the dune margins.

Well-documented human occupation of the southern California Deserts occurred as early as 12,000 years ago, but some researchers have posited much earlier occupations as well. The Paleoindian period is manifested locally by the San Dieguito Complex, dating from about 12,000 to about 7,000 years ago. Most evidence suggests that these peoples were highly nomadic hunter-gatherers, who ranged widely across the arid Southwest. The subsequent Archaic period from about 7,000 to about 1,500 years ago is much better documented in surrounding areas, such as the Mojave Desert, the California coast, and Sonoran Desert in Arizona, than in the Lower Colorado Desert. Very few Archaic period sites have been found in Imperial County, due, in part, to arid conditions and loss due to Colorado River erosion and other impacts (Schaefer, 1994). Human occupation increased dramatically after 1,500 years ago. Archaeologists believe that ancestral Yuman-speaking groups settled along the Lower Colorado River during this time when the manufacture of pottery was first introduced. Agriculture, including the cultivation of maize, was also introduced, leading to increased populations. During this time, hydrological changes in the Colorado River delta caused the river to flow north into the Salton basin and form a vast fresh-water lake known as Lake Cahuilla. Native American groups from the river to the east and the Peninsular and Transverse ranges to the west occupied the shores of the lake at least on a temporary basis. During the Late Prehistoric period, long-distance travel for trade, warfare, and religious pilgrimages was a common practice. The Dunes probably were traversed by travel corridors, although major trails also skirted the deep sand.

Yuman-speaking Indians included the area in their tribal territory when Spaniards began to exert influence in the region in the late 1770s. Major settlements for these aboriginal groups were typically located in the mountains to the west or along the Colorado River to the east. Groups would collect resources in the Plan Area and return to larger encampments.



### **3.8.1.2 History**

Early Spanish incursions into the Lower Colorado region began in 1540, although Spanish influence was relatively minor until the 18<sup>th</sup> century. Relationships with the local inhabitants were not always good. Initially most development occurred along the Colorado River. In the mid-1880s, to support local mining efforts, the Southern Pacific Railroad built a line that crosses what is now the eastern portion of the ISDRA. Regular service on the route began in 1877. Small communities, such as Ogilby, developed at some of the stops along the line. Around the turn of the century, the Imperial Valley experienced considerable population growth after the construction of irrigation projects. To the present day, Imperial Valley is an important agricultural area. In 1915, the planning and hard work of a group of businessmen, including Edward Fletcher and Edwin Boyd, resulted in the construction of the first plank road through the dunes (PHR Associates and Carrico, 1989). At one time, there were 8 miles of the wooden road, providing a route that shortened travel time from San Diego to Yuma by 2 days (Bates, 1970). During World War II, undeveloped portions of southeastern California, western Arizona, and southern Nevada became a vast military training area. Camp Pilot Knob, located west of the ISDRA, was one of the desert military training camps established by General George S. Patton, Jr. This large temporary settlement comprised 3,000 tents occupied by the 55<sup>th</sup> Infantry Division. In 1943, they used the camp and the surrounding areas, including the dunes, for military training maneuvers.

The 1970s and 1980s saw several construction projects in the southern part of the recreation area, with the replacement of SR-80 with I-8 and the construction of a 500-kV transmission line. These features joined the All American Canal, which had been built in the 1930s.

### **3.8.2 Current Inventory**

A records search was conducted at the South East Archaeological Information Center to identify previous studies in the area and to locate known cultural resources. One cultural resource site currently featured for visitors to the ISDRA is the Plank Road, portions of which can be viewed adjacent to I-8. In 1985, the BLM designated the Plank Road an ACEC. The Plank Road, All American Canal, and Coachella Canal all are eligible for the National Register of Historic Places (NRHP).

#### **3.8.2.1 Surveys**

At least 20 archaeological studies have been conducted within the limits of the ISDRA. Some of the earliest documented work was in the 1950s, with the majority of surveys being carried out in the 1980s and 1990s. Many of the inventories were associated with linear projects (highways, canals, pipelines, and transmission lines). An exception to this was a major sample survey effort that the BLM conducted in the late 1970s and early 1980s. In this study, a large number of 1-mile by ¼-mile transects were surveyed throughout the dunes (Bull, 1981). Despite a number of studies having been conducted, most of the ISDRA has not been inventoried for cultural resources (see Table 3.8-1).

Based on the records search results, the level of survey appears to vary in different parts of the ISDRA. The southern portion of the ISDRA has been



subject to the most survey investigations. These investigations were generally associated with infrastructure projects and the BLM sample survey. Additional information will be available when a stratified sample survey that is underway in the spring of 2002 is completed.

**Table 3.8-1 Reported Survey Coverage By ISDRA Management Area**

MANAGEMENT AREA	APPROXIMATE SURVEY COVERAGE
Mammoth	<1%
North Algodones	<2%
Gecko	5%
Glamis	<3%
Dune Buggy	16%
Adaptive Management	6%
Ogilby	<1%
Buttercup	14%
Buffer	<1% <sup>1</sup>

<sup>1</sup>Preliminary

### 3.8.2.2 Cultural Resources

Over 120 cultural resources are recorded in the Plan Area. As Table 3.8-2 indicates, most of these are prehistoric archaeological sites, representing a range of activities. Although fewer historic period resources have been identified, these reflect the major historic themes of the region: mining, transportation, irrigation projects, and military activity.

**Table 3.8-2 ISDRA Cultural Resources Summary<sup>1</sup>**

PREHISTORIC RESOURCES		HISTORIC PERIOD RESOURCES	
Lithic scatters	6	Debris scatter/dump	17
Ceramic scatters	37	Military encampment	2
Habitation areas/temporary camps	9	Plank road/Roads/Railroad	5
Cleared circle	1	Canal	2
Lithic and ceramic scatter	7	Transmission line	1
Cremation	2	Rock features	1
Isolated finds	14	Movie set/Townsite/Graveyard	4
		Isolated finds/Other	14
Total	76	Total	46

<sup>1</sup>Record search data are preliminary for Buffer Area.

As indicated in Table 3.8-3, most of the known cultural resources have been identified in the Buffer and Ogilby Management Areas, although the size of the Management Areas varies widely. These data provide a resource



summary that will be supplemented by the cultural resources sample survey being conducted in the spring of 2002.

**Table 3.8-3 Known Cultural Resources By ISDRA Management Area**

MANAGEMENT AREA	PREHISTORIC RESOURCES		HISTORIC RESOURCES		TOTAL
	SITES	ISOLATES	SITES	ISOLATES	
Mammoth	3	0	1	0	4
North Algodones Dunes Wilderness Area					1*
Gecko	4	0	1	0	5
Glamis	1	1	2	2	6
Dune Buggy	13	0	0	0	13
AMA	2	0	3	1	6
Ogilby	11	3	7	1	22
Buttercup	7	3	2	0	12
Buffer	21	7	13	9	50
Resources in Multiple Management Areas	0	0	4	0	4

<sup>1</sup>One resource reported but not identified.

### 3.8.3 Management Practices

Projects involving proposed ground disturbing activities are subject to the Section 106 compliance process as prescribed in the BLM National Programmatic Agreement (NPA). Under the provision of the NPA, a Preservation Board was established and tasked with the review and revision of a series of Cultural Resource Management Manuals to provide detailed guidance for compliance efforts. When a project is proposed, inventory (Manual 8110) is conducted to identify cultural resources that are potentially eligible for the NRHP. Potentially eligible resources are evaluated, and treatment is carried out for eligible historic properties that cannot be avoided (Manual 8120). Under the NPA, there are also provisions for utilizing cultural resources for public benefit (Manual 8130), as are in place for the Plank Road.

### 3.8.4 Future Trends

The BLM recently has commissioned a cultural landscape study for the dunes and a sample survey for the ISDRA. The landscape study involves a holistic review of cultural elements present in the area. Both the archaeological resources and Native American values are being included in the investigation. A preliminary report on the landscape study indicates that local Native Americans have maintained a strong connection with the dunes and generally view the landscape as important. The sample survey will address different dune settings: high dunes, dune pans, and dune edge. The goal of the survey is to achieve a 5 percent sample of the Imperial Dunes, inclusive of previous systematic survey.



### 3.9 TRANSPORTATION AND TRAFFIC

This discussion addresses the existing vehicular traffic at the ISDRA. The scope of the analysis is limited to major public roads that provide access to the Plan Areas.

#### 3.9.1 Existing Access

Figure 3.9-1 shows the existing access to the Plan Area that extends for more than 40 miles long and 5 miles wide near the borders of California, Arizona, and Mexico. I-8 is the only freeway providing access through the south side of the Plan Area. It is a four-lane facility linking San Diego and Arizona. SR-98 is an arterial branch from I-8 south of El Centro. It terminates and joins I-8 approximately 15 miles west of the Plan Area. SR-78 is an east-west oriented highway traversing across the central part of San Diego and Imperial Counties. It provides access to the northern end of the Plan Area and traverses north to link with I-10. Ogilby Road is a county road (S-34) linking SR-78 and I-8 along the eastern edge of the Plan Area.

#### 3.9.2 Existing Traffic Volumes

Figure 3.9-2 shows 1999 and 2000 traffic volumes on major access roadways in the vicinity of the Plan Area. The heaviest traveled segment of roadway is on I-8 west of Sidewinder Road. It has an Average Annual Daily Traffic (AADT or ADT) volume of 13,000 vehicles and a peak-hour volume of 1,850 vehicles. The existing Level of Service (LOS) for roadway segments in the vicinity of the Plan Area is summarized in Table 3.9-1.

Table 3.9-1 2000 Level of Services

ROUTE	SEGMENT	PEAK-HOUR VOLUME	LEVEL OF SERVICE (LOS)	NOTES
I-8	West of SR-98	1,400	B	HCM <sup>1</sup> -98
I-8	East of SR-98	1,650	B	HCM-98
I-8	Buttercup	1,700	B	HCM-98
I-8	East of Ogilby Rd	1,750	B	HCM-98
I-8	East of Sidewinder Rd	1,850	B	HCM-98
SR-98	West of I-8	160	A	v/c <sup>2</sup> =0.05, rolling terrain, no passing 80%
SR-78	West of Glamis	530	C	v/c=0.19, rolling terrain, no passing 80%
SR-78	East of Glamis	290	B	v/c=0.10, rolling terrain, no passing 80%
SR-78	East of Ogilby Rd	450	C	v/c=0.16, rolling terrain, no passing 80%

<sup>1</sup>HCM: Highway Capacity Manual, Transportation Research Board, National Research Council, Figure 3-4

<sup>2</sup>v/c: Volume over capacity ratio



LOS is a measure of the quality of traffic operations based on selected factors of the type of roadway. LOS are designated from A through F. LOS A represents the best operation condition with significant freedom of maneuver, while LOS F signifies a severely congested situation with extensive delays. LOS C is generally accepted as the threshold for rural highways. The evaluation of LOS is based on methods recommended in *The Highway Capacity Manual* (HCM) published by Transportation Research Board of the National Research Council.

Table 3.9-1 indicates that all segments of roadways are operating at LOS C and better. The I-8 freeway is operating at LOS B in the vicinity of the Plan Area. It is based on the 55-mile-per-hour (mph) free-flow speed and the HCM density flow rate chart for basic freeway segments. The LOS on SR-78 varied from A to C, based on HCM LOS chart for a two-lane highway on rolling terrain and the assumption that no passing zones comprise 80 percent of the routes.

Figure 3.9-3 shows the distribution of recreational traffic related to ISDRA on existing roadway network. The distribution factors are derived from the *Imperial Sand Dunes Visitor Research Case Study* prepared in 1993 by the BLM. Table 3.9-2 shows the percentage of ISDRA traffic on the major highway segments providing access to the Plan Area. It is noted that the annual ISDRA traffic has a more significant share on SR-78 west of the Plan Area. It is 17.3 percent of the total annual traffic. The percentages of ISDRA traffic on I-8 are 5.4 percent west of the Plan Area and 0.7 percent east of the Plan Area. The shares on I-8 are relatively low because it is an interstate freeway carrying a significant amount of regional traffic between California and Arizona. Based on the annual traffic share volumes, it is observed that the segment of SR-78 west of the Plan Area would be more sensitive to the ISDRA RAMP that dictates future traffic projections.

**Table 3.9-2 Annual Shares of ISDRA Traffic<sup>1</sup>**

ACCESS	ISDRA TRAFFIC		TOTAL TRAFFIC		% OF ISDRA TRAFFIC
	% DISTRIBUTION	1999/2000 ANNUAL ISDRA TRAFFIC	2000 AADT <sup>2</sup>	2000 ANNUAL TOTAL TRAFFIC	
I-8 West	50	247,830	9,500	3,467,500	7.1
I-8 East	8	39,669	12,200	4,453,000	0.9
SR-78 West	32	158,675	1,900	693,500	22.9
SR-78 East	8	39,669	1,650	602,300	6.6
SR-98 West	2	9,917	1,450	529,300	1.9

<sup>1</sup>Based on annual project generated traffic of 495,860

<sup>2</sup>Annual Average Daily Traffic (AADT)

Source: California Department of Transportation



### 3.9.3 Seasonal Fluctuation and Peak- Hour Volumes

Historical records of ISDRA attendance indicate that it has a highly concentrated seasonal fluctuation typical of rural resort areas. Table 3.9-3 estimates the seasonal concentration of ISDRA attendance.

**Table 3.9-3 Peak Attendance as ISDRA (2000-2001)**

PEAK PERIOD	DURATION	PERCENT OF ANNUAL ATTENDANCE
Halloween	6 days	7
Thanksgiving	8 days	12
New Year	6 days	8
Martin Luther King's Birthday	6 days	5
President's Day	6 days	10
Easter	5 days	8
(October - May)		50

Table 3.9-3 shows that the six peak holiday seasons between mid-October and mid-April accounted for 50 percent of the visits. The Thanksgiving week is among the most crowded week and contributed 12 percent of annual attendance.

Source	Frequency	Sound Level (dBA)	Notes
Highway Traffic	100	60-70	Typical for the area
Construction	100	70-80	Typical for the area
Industrial	100	80-90	Typical for the area
Residential	100	50-60	Typical for the area
Natural	100	40-50	Typical for the area
Recreational	100	60-70	Typical for the area
Commercial	100	60-70	Typical for the area
Public Works	100	60-70	Typical for the area
Emergency Services	100	60-70	Typical for the area
Aviation	100	60-70	Typical for the area
Marine	100	60-70	Typical for the area
Offshore	100	60-70	Typical for the area
Onshore	100	60-70	Typical for the area
Underground	100	60-70	Typical for the area
Surface	100	60-70	Typical for the area
Subsurface	100	60-70	Typical for the area
Atmosphere	100	60-70	Typical for the area
Hydrosphere	100	60-70	Typical for the area
Biosphere	100	60-70	Typical for the area
Geosphere	100	60-70	Typical for the area
Anthroposphere	100	60-70	Typical for the area
Technosphere	100	60-70	Typical for the area
Infosphere	100	60-70	Typical for the area
Energy	100	60-70	Typical for the area
Materials	100	60-70	Typical for the area
Life	100	60-70	Typical for the area
Non-life	100	60-70	Typical for the area
Organic	100	60-70	Typical for the area
Inorganic	100	60-70	Typical for the area
Living	100	60-70	Typical for the area
Non-living	100	60-70	Typical for the area
Plant	100	60-70	Typical for the area
Animal	100	60-70	Typical for the area
Human	100	60-70	Typical for the area
Machine	100	60-70	Typical for the area
System	100	60-70	Typical for the area
Process	100	60-70	Typical for the area
Product	100	60-70	Typical for the area
Service	100	60-70	Typical for the area
Information	100	60-70	Typical for the area
Knowledge	100	60-70	Typical for the area
Wisdom	100	60-70	Typical for the area
Understanding	100	60-70	Typical for the area
Consciousness	100	60-70	Typical for the area
Sentience	100	60-70	Typical for the area
Feeling	100	60-70	Typical for the area
Emotion	100	60-70	Typical for the area
Mood	100	60-70	Typical for the area
Attitude	100	60-70	Typical for the area
Belief	100	60-70	Typical for the area
Opinion	100	60-70	Typical for the area
View	100	60-70	Typical for the area
Point of view	100	60-70	Typical for the area
Standpoint	100	60-70	Typical for the area
Position	100	60-70	Typical for the area
Location	100	60-70	Typical for the area
Place	100	60-70	Typical for the area
Spot	100	60-70	Typical for the area
Site	100	60-70	Typical for the area
Area	100	60-70	Typical for the area
Zone	100	60-70	Typical for the area
Region	100	60-70	Typical for the area
Territory	100	60-70	Typical for the area
Domain	100	60-70	Typical for the area
Field	100	60-70	Typical for the area
Realm	100	60-70	Typical for the area
World	100	60-70	Typical for the area
Universe	100	60-70	Typical for the area
Cosmos	100	60-70	Typical for the area
Nature	100	60-70	Typical for the area
Environment	100	60-70	Typical for the area
Ecology	100	60-70	Typical for the area
Biology	100	60-70	Typical for the area
Geology	100	60-70	Typical for the area
Chemistry	100	60-70	Typical for the area
Physics	100	60-70	Typical for the area
Mathematics	100	60-70	Typical for the area
Science	100	60-70	Typical for the area
Technology	100	60-70	Typical for the area
Engineering	100	60-70	Typical for the area
Architecture	100	60-70	Typical for the area
Art	100	60-70	Typical for the area
Music	100	60-70	Typical for the area
Dance	100	60-70	Typical for the area
Theater	100	60-70	Typical for the area
Film	100	60-70	Typical for the area
Television	100	60-70	Typical for the area
Radio	100	60-70	Typical for the area
Internet	100	60-70	Typical for the area
Computer	100	60-70	Typical for the area
Mobile phone	100	60-70	Typical for the area
Smartphone	100	60-70	Typical for the area
Tablet	100	60-70	Typical for the area
Laptop	100	60-70	Typical for the area
Desktop	100	60-70	Typical for the area
Server	100	60-70	Typical for the area
Router	100	60-70	Typical for the area
Switch	100	60-70	Typical for the area
Hub	100	60-70	Typical for the area
Bridge	100	60-70	Typical for the area
Gateway	100	60-70	Typical for the area
Firewall	100	60-70	Typical for the area
Proxy	100	60-70	Typical for the area
Cache	100	60-70	Typical for the area
Proxy server	100	60-70	Typical for the area
Web server	100	60-70	Typical for the area
Mail server	100	60-70	Typical for the area
FTP server	100	60-70	Typical for the area
Database server	100	60-70	Typical for the area
Application server	100	60-70	Typical for the area
Load balancer	100	60-70	Typical for the area
Reverse proxy	100	60-70	Typical for the area
CDN	100	60-70	Typical for the area
Cloud storage	100	60-70	Typical for the area
Cloud computing	100	60-70	Typical for the area
Cloud services	100	60-70	Typical for the area
Cloud applications	100	60-70	Typical for the area
Cloud infrastructure	100	60-70	Typical for the area
Cloud management	100	60-70	Typical for the area
Cloud security	100	60-70	Typical for the area
Cloud privacy	100	60-70	Typical for the area
Cloud integrity	100	60-70	Typical for the area
Cloud confidentiality	100	60-70	Typical for the area
Cloud non-repudiation	100	60-70	Typical for the area
Cloud accountability	100	60-70	Typical for the area
Cloud transparency	100	60-70	Typical for the area
Cloud auditability	100	60-70	Typical for the area
Cloud traceability	100	60-70	Typical for the area
Cloud identifiability	100	60-70	Typical for the area
Cloud linkability	100	60-70	Typical for the area
Cloud detectability	100	60-70	Typical for the area
Cloud predictability	100	60-70	Typical for the area
Cloud verifiability	100	60-70	Typical for the area
Cloud enforceability	100	60-70	Typical for the area
Cloud reparability	100	60-70	Typical for the area
Cloud recoverability	100	60-70	Typical for the area
Cloud resilience	100	60-70	Typical for the area
Cloud robustness	100	60-70	Typical for the area
Cloud fault tolerance	100	60-70	Typical for the area
Cloud disaster recovery	100	60-70	Typical for the area
Cloud business continuity	100	60-70	Typical for the area
Cloud risk management	100	60-70	Typical for the area
Cloud compliance	100	60-70	Typical for the area
Cloud governance	100	60-70	Typical for the area
Cloud operations	100	60-70	Typical for the area
Cloud support	100	60-70	Typical for the area
Cloud training	100	60-70	Typical for the area
Cloud consulting	100	60-70	Typical for the area
Cloud integration	100	60-70	Typical for the area
Cloud migration	100	60-70	Typical for the area
Cloud optimization	100	60-70	Typical for the area
Cloud performance	100	60-70	Typical for the area
Cloud availability	100	60-70	Typical for the area
Cloud reliability	100	60-70	Typical for the area
Cloud scalability	100	60-70	Typical for the area
Cloud flexibility	100	60-70	Typical for the area
Cloud portability	100	60-70	Typical for the area
Cloud interoperability	100	60-70	Typical for the area
Cloud compatibility	100	60-70	Typical for the area
Cloud security	100	60-70	Typical for the area
Cloud privacy	100	60-70	Typical for the area
Cloud integrity	100	60-70	Typical for the area
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Cloud non-repudiation	100	60-70	Typical for the area
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Cloud transparency	100	60-70	Typical for the area
Cloud auditability	100	60-70	Typical for the area
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Cloud detectability	100	60-70	Typical for the area
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Cloud enforceability	100	60-70	Typical for the area
Cloud reparability	100	60-70	Typical for the area
Cloud recoverability	100	60-70	Typical for the area
Cloud resilience	100	60-70	Typical for the area
Cloud robustness	100	60-70	Typical for the area
Cloud fault tolerance	100	60-70	Typical for the area
Cloud disaster recovery	100	60-70	Typical for the area
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Cloud integration	100	60-70	Typical for the area
Cloud migration	100	60-70	Typical for the area
Cloud optimization	100	60-70	Typical for the area
Cloud performance	100	60-70	Typical for the area
Cloud availability	100	60-70	Typical for the area
Cloud reliability	100	60-70	Typical for the area
Cloud scalability	100	60-70	Typical for the area
Cloud flexibility	100	60-70	Typical for the area
Cloud portability	100	60-70	Typical for the area
Cloud interoperability	100	60-70	Typical for the area
Cloud compatibility	100	60-70	Typical for the area
Cloud security	100	60-70	Typical for the area
Cloud privacy	100	60-70	Typical for the area
Cloud integrity	100	60-70	Typical for the area
Cloud confidentiality	100	60-70	Typical for the area
Cloud non-repudiation	100	60-70	Typical for the area
Cloud accountability	100	60-70	Typical for the area
Cloud transparency	100	60-70	Typical for the area
Cloud auditability	100	60-70	Typical for the area
Cloud traceability	100	60-70	Typical for the area
Cloud identifiability	100	60-70	Typical for the area
Cloud linkability	100	60-70	Typical for the area
Cloud detectability	100	60-70	Typical for the area
Cloud predictability	100	60-70	Typical for the area
Cloud verifiability	100	60-70	Typical for the area
Cloud enforceability	100	60-70	Typical for the area
Cloud reparability	100	60-70	Typical for the area
Cloud recoverability	100	60-70	Typical for the area
Cloud resilience	100	60-70	Typical for the area
Cloud robustness	100	60-70	Typical for the area
Cloud fault tolerance	100	60-70	Typical for the area
Cloud disaster recovery	100	60-70	Typical for the area
Cloud business continuity	100	60-70	Typical for the area
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Cloud migration	100	60-70	Typical for the area
Cloud optimization	100	60-70	Typical for the area
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Cloud availability	100	60-70	Typical for the area
Cloud reliability	100	60-70	Typical for the area
Cloud scalability	100	60-70	Typical for the area
Cloud flexibility	100	60-70	Typical for the area
Cloud portability	100	60-70	Typical for the area
Cloud interoperability	100	60-70	Typical for the area
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Cloud security	100	60-70	Typical for the area
Cloud privacy	100	60-70	Typical for the area
Cloud integrity	100	60-70	Typical for the area
Cloud confidentiality	100	60-70	Typical for the area
Cloud non-repudiation	100	60-70	Typical for the area
Cloud accountability	100	60-70	Typical for the area
Cloud transparency	100	60-70	Typical for the area
Cloud auditability	100	60-70	Typical for the area
Cloud traceability	100	60-70	Typical for the area
Cloud identifiability	100	60-70	Typical for the area
Cloud linkability	100	60-70	Typical for the area
Cloud detectability	100	60-70	Typical for the area
Cloud predictability	100	60-70	Typical for the area
Cloud verifiability	100	60-70	Typical for the area
Cloud enforceability	100	60-70	Typical for the area
Cloud reparability	100	60-70	Typical for the area
Cloud recoverability	100	60-70	Typical for the area
Cloud resilience	100	60-70	Typical for the area
Cloud robustness	100	60-70	Typical for the area
Cloud fault tolerance	100	60-70	Typical for the area
Cloud disaster recovery	100		



### 3.10 NOISE

#### 3.10.1 Fundamental s of Noise

Noise is defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. There are several ways to measure noise, depending on the source of the noise, the receiver, and the reason for the noise measurement. Environmental noise levels are typically stated in terms of decibels on the A-weighted scale [dB(A) or dBA]. Noise levels stated in terms of dBA reflect the response of the human ear by filtering out some of the noise in the low- and high-frequency ranges that the ear does not detect well. The A-weighted scale is used in most community ordinances and standards. Human hearing typically encompasses the sound range from just above 0 dBA at the quietest end to approximately 140 dBA, where pain is produced in most listeners and permanent hearing loss would result.

Table 3.10-1 shows the relative A-weighted sound levels of common sources measured in the environment and in industry (Beranek, 1988).

#### 3.10.2 Regulatory Framework

The Noise Element of the Imperial County General Plan provides a program for incorporating noise issues into the land use and planning process, with a goal of minimizing adverse noise impacts to sensitive noise receptors. The Noise Element establishes goals, objectives, and procedures to protect the public from noise intrusion. The Noise Element for Imperial County is applicable to lands owned or zoned by the county. However, lands regulated by the state or federal government, such as the ISDRA, are pre-empted from local land use policy (Imperial County, 1993).

#### 3.10.3 Existing Noise Environment

The ISDRA is in a relatively remote desert region of the southeastern portion of the state. The Chocolate Mountains and Cargo Muchacho Mountains are located to the north and east of the Plan Area. The town of Brawley is located to the west, and Mexico is located to the south. Recreational activities that occur on ISDRA include OHV use, camping, hiking, and flora/fauna observation.

**Table 3.10-1 Typical Sound Levels Measured in the Environment and Industry**

NOISE SOURCE AT A GIVEN DISTANCE	A-WEIGHTED SOUND LEVEL IN DECIBELS	NOISE ENVIRONMENTS	SUBJECTIVE IMPRESSION
Shotgun	140	Carrier Flight Deck	
Civil Defense Siren (100 ft)	130		
Jet Takeoff (200 ft)	120		Threshold of Pain
Loud Rock Music	110	Rock Music Concert	
Pile Driver (50 ft)	100		Very Loud
Ambulance Siren (100 ft)			



Table 3.10-1 Typical Sound Levels Measured in the Environment and Industry

NOISE SOURCE AT A GIVEN DISTANCE	A-WEIGHTED SOUND LEVEL IN DECIBELS	NOISE ENVIRONMENTS	SUBJECTIVE IMPRESSION
	90	Boiler Room	
Freight Cars (50 ft)		Printing Press Plant	
Pneumatic Drill (50 ft) Freeway (100 ft)	80	Noisy Restaurant	
Busy Traffic; Hair Dryer	70		Moderately Loud
Normal Conversation (5 ft)	60	Data Processing Center	
Air Conditioning Unit (100 ft)		Department Store	
Light Traffic (100 ft); Rainfall	50	Private Business Office	
Large Transformer (200 ft)			
Bird Calls (distant)	40	Average Living Room Library	Quiet
Soft Whisper (5 ft); Rustling Leaves	30	Quiet Bedroom	
	20	Recording Studio	
Normal Breathing	10		
	0		Threshold of Hearing

Source: Beranek, 1988

Ambient noise level measurements for the Plan Area are not available. However, ambient noise levels in the Plan Area and vicinity generally are assumed low and typical of remote desert areas (i.e., 35 to 50 dBA), except as may be modified by noise- generating activities in the Plan Area and vicinity, including:

- Noise from train movements on the Southern Pacific Railroad tracks located along the east side of the Plan Area
- Noise associated with occasional recreational and support activities, especially both concentrated and dispersed OHV uses of the Plan Area and immediate vicinity
- Vehicular traffic noise on major roadways leading to the Plan Area



- Intermittent military aircraft maneuvers and military weapons explosions associated with the use of the Chocolate Mountain Aerial Gunnery Range (CMAGR) located to the northwest of the Plan Area and a gunnery range north of East Mesa
- Occasional military aircraft overflights associated with flight corridors located above and adjacent to the Plan Area
- Military helicopter use of the Plan Area as a training ground for the use of night vision devices
- Mineral exploration, including drilling by Glamis Imperial under existing BLM approvals
- Natural sources such as wind, rain, thunder, and wildlife

### 3.10.3.1 OHV Noise Levels

OHV activities and vehicular traffic on local roads are the primary noise sources in the Plan Area. OHV noise levels are variable, with older vehicles producing higher noise levels than newer ones. California Vehicle Code Section 38370 requires that decibel levels (measured at 50 feet) for Green Sticker vehicles be below 92 dBA for vehicles manufactured before 1973 and below 82 dBA for those manufactured after 1986. According to data from *Dirt Wheels* Magazine, and tests from Oregon Dunes National Recreation Area, even with mufflers, noise levels from ATVs are found to be in the range of 81 to 111 dBA per unit at a distance of 20 inches (Scharf, 1999). A noise level of 111 dBA at 20 inches is estimated to attenuate to a level of approximately 85 dBA at a distance of 50 feet.

San Diego County performed a preliminary study of various OHV routes (OHV Route Location Study) in 1999 to identify and recommend OHV routes in the county. As part of that study, the county performed a preliminary noise analysis. Based on feedback from the San Diego Off-Road Coalition and input from the State Off Highway Motor Vehicle Recreation division (California State Parks), the county determined that a noise level of 92 dB was appropriate in their study (San Diego County, 2001). For purposes of this section, 92 dBA will be the assumed noise level at 50 feet for OHV use within the ISDRA.

The level of OHV activities in or near the Plan Area varies throughout the year, with little, if any, OHV use and noise during the summer months. Virtually all OHV usage in ISDRA occurs from approximately mid-October to May, with approximately 50 percent of total annual OHV usage occurring on the following six weekends: Halloween, Thanksgiving, New Years, Martin Luther King Jr., President's Day, and Easter. During these high-use weekends, OHV-related noise levels at the ISDRA can be relatively high within certain areas of the Plan Area. The remaining 50 percent of annual OHV usage occurs primarily on other weekends throughout the October-May period. Therefore, background OHV noise levels in and around the Plan Area range from low (during weekdays) to moderate during moderate-use weekends, and high during the six high-use weekends.



### 3.10.3.2 Sensitive Receptors

Sensitive noise receptors are, in general, those areas of human habitation or substantial use where the intrusion of noise has the potential to adversely impact the occupancy, use, or enjoyment of the environment. These can include residences, schools, hospitals, parks, and places of business requiring low levels of noise. Since the Plan Area is situated in a very remote area, there are no such typical sensitive human receptors in or anywhere near the Plan Area. The Cahuilla Ranger Station is located within the Plan Area, but is considered part of the administration of the ISDRA and therefore not a sensitive receptor. Hiking and flora/fauna observation activities that occur in the North Algodones Dunes Wilderness area may be more enjoyable in a quiet environment.

The closest area of likely sensitive receptors would be an unincorporated area of Imperial County located just west of East Mesa and the East Highline Canal (approximately 7 miles west of the Plan Area). The town of Brawley is located farther west, approximately 25 miles to the west of the Plan Area.



## 3.11 AIR QUALITY

### 3.11.1 Definition of Resource

Air quality is defined by ambient air concentrations of specific pollutants determined to be of concern with respect to the health and welfare of the general public. National air quality policies are regulated through the Federal Clean Air Act (CAA) of 1970 and its 1977 and 1990 Amendments. Pursuant to the CAA, the U.S. Environmental Protection Agency (EPA) established national ambient air quality standards (NAAQS) to protect the public health and welfare from the effects of air pollution. Current standards are established for six air pollutants: carbon monoxide (CO), ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), PM<sub>10</sub>, and lead (Pb). These pollutants are referred to as “criteria” pollutants because numerical health-based criteria have been established for each that define acceptable levels of exposure. Areas that violate a federal air quality standard are designated as nonattainment areas.

Pollutant emissions typically refer to the amount of pollutants or pollutant precursors introduced into the atmosphere by a source or group of sources. Pollutant emissions contribute to the ambient air concentrations of criteria pollutants, either by directly affecting the pollutant concentrations measured in the ambient air or by interacting in the atmosphere to form criteria pollutants. Primary pollutants, such as CO, SO<sub>2</sub>, Pb, and some particulates, are emitted directly into the atmosphere from emission sources. Secondary pollutants, such as O<sub>3</sub>, NO<sub>2</sub>, and some particulates, are formed through atmospheric chemical reactions that are influenced by meteorology, ultraviolet light, and other atmospheric processes. In general, emissions that are considered “precursors” to secondary pollutants in the atmosphere (such as reactive organic gases (ROG) and oxides of nitrogen (NO<sub>x</sub>), which are considered precursors for O<sub>3</sub>) are the pollutants for which emissions are evaluated to control the level of O<sub>3</sub> in the ambient air.

The California Air Resources Board (CARB) subsequently established the more stringent California Ambient Air Quality Standards (CAAQS). Areas within California in which ambient air concentrations of a pollutant are higher than the state or federal or both standards are considered to be nonattainment for that pollutant. Table 3.11-1 shows both the federal and state ambient air quality standards.

EPA has revised the NAAQS several times since their original implementation and will continue to do so as the understanding of the health effects of exposure to pollution is improved. New standards for 8-hour O<sub>3</sub> and PM<sub>2.5</sub> were proposed on September 15, 1997; and policies and systems to implement these new standards will be developed in the coming years. Compliance with these new standards will be addressed during the next update of the applicable regional air quality plan, if sufficient monitoring data are available. In some cases, there may be delays of several years to allow data collection to determine baseline levels.



TABLE 3.11-1 CALIFORNIA AND NATIONAL AMBIENT AIR QUALITY STANDARDS

POLLUTANT	AVERAGING TIME	CALIFORNIA STANDARDS <sup>1</sup>	NATIONAL STANDARDS <sup>2</sup>	
		CONCENTRATION <sup>3</sup>	PRIMARY <sup>3,4</sup>	SECONDARY <sup>3,5</sup>
Ozone (O <sub>3</sub> )	1 Hour	0.09 ppm (180 µg/m <sup>3</sup> )	0.12 ppm (235 µg/m <sup>3</sup> )	Same as Primary Standard
	8 Hour	-	0.08 ppm <sup>6</sup>	-
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 mg/m <sup>3</sup> )	9.0 ppm (10 mg/m <sup>3</sup> )	-
	1 Hour	20 ppm (23 mg/m <sup>3</sup> )	35 ppm (40 mg/m <sup>3</sup> )	-
Nitrogen Dioxide (NO <sub>2</sub> )	Annual Average	-	0.053 ppm (100 µg/m <sup>3</sup> )	Same as Primary Standard
	1 Hour	0.25 ppm (470 µg/m <sup>3</sup> )	-	-
Sulfur Dioxide (SO <sub>2</sub> )	Annual Average	-	80 µg/m <sup>3</sup> (0.03 ppm)	-
	24 Hour	0.04 ppm (105 µg/m <sup>3</sup> )	365 µg/m <sup>3</sup> (0.14 ppm)	-
	3 Hour	-	-	1300 µg/m <sup>3</sup> (0.5 ppm)
	1 Hour	0.25 ppm (655 µg/m <sup>3</sup> )	-	-
Suspended Particulate Matter (PM <sub>10</sub> )	Annual Geometric Mean	30 µg/m <sup>3</sup>	-	-
	24 Hour	50 µg/m <sup>3</sup>	150 µg/m <sup>3</sup>	-
	Annual Arithmetic Mean	-	50 µg/m <sup>3</sup>	-
Fine Particulate Matter (PM <sub>2.5</sub> ) <sup>6</sup>	24 Hour	-	65 µg/m <sup>3</sup>	-
	Annual Arithmetic Mean	-	15 µg/m <sup>3</sup>	-
Sulfates (SO <sub>4</sub> )	24 Hour	25 µg/m <sup>3</sup>	No Federal Standards	No Federal Standards
Lead (Pb)	30 Day Average	1.5 µg/m <sup>3</sup>	-	-
	Calendar Quarter	-	1.5 µg/m <sup>3</sup>	Same as Primary Standard
Hydrogen Sulfide (HS)	1 Hour	0.03 ppm (42 µg/m <sup>3</sup> )	No Federal Standards	No Federal Standards
Vinyl Chloride (chloroethene)	24 Hour	0.010 ppm (26 µg/m <sup>3</sup> )	No Federal Standards	No Federal Standards
Visibility Reducing Particles	8 Hour (10 am-6 pm, Pacific Standard Time)	Insufficient amount to produce an extinction coefficient of 0.23 per kilometer—visibility of 10 miles or more (0.07-30 miles or more for Lake Tahoe) due to particles when the relative humidity is less than 70 percent. Method: ARB Method V (8/18/89).	No Federal Standards	No Federal Standards

Source: ARB Fact Sheet 39 (11/91); SCAQMD bulletin (8/97) and [www.arb.ca.gov](http://www.arb.ca.gov)

1. California standards, other than ozone, carbon monoxide, sulfur dioxide (1 hour), nitrogen dioxide, PM<sub>10</sub>, are values that are not to be equaled or exceeded. The ozone, carbon monoxide, sulfur dioxide (1 hour), nitrogen dioxide, and PM<sub>10</sub> standards are not to be exceeded.
2. National standards, other than ozone and those based on annual averages or annual geometric means, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above standard is equal to or less than one.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 mm of mercury. All measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 mm of mercury (1,013.2 millibar). PPM in this table refers to parts per million by volume or micromoles of pollutant per mole of gas.
4. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health. Each state must attain the primary standards within a specified number of years after that state's implementation plan is approved by EPA.
5. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the implementation plan is approved by EPA.
6. New federal 8-hour ozone and fine particulate matter standards were promulgated by EPA on July 18, 1997. The federal 1-hour ozone standard continues to apply in areas that violated the standard. Contact EPA for further clarification and current federal policies.



ISDRA is located in Imperial County, which is in the Salton Sea Air Basin (SSAB). The climate of Imperial County exhibits climatological characteristics typical of a desert: low annual precipitation, very hot summers, mild winters, high evaporation rates, and strong inversions. One of the main determinants of climatology is a semipermanent high-pressure area (the Pacific High) in the eastern Pacific Ocean. In the summer, this pressure center is located well to the north, causing storm tracks to be directed north of California. This high-pressure cell maintains clear skies for much of the year. When the Pacific High moves southward during the winter, weakened low-pressure storms and the orographic barrier brings little rainfall. The combination of subsiding air, protective mountains, and distance from the ocean severely limits precipitation. In Imperial County, the precipitation level is very low, averaging 2.40 inches annually (NOAA, 2001). A summary of the monthly temperatures and precipitation are shown in Table 3.11-2. The mean temperature is 73.1°F, and the mean maximum and mean minimum temperatures are 87.7° F and 58.5° F, respectively (NOAA, 2001).

The flat terrain of Imperial Valley and the strong temperature differentials created by intense solar heating produce moderate winds and deep thermal convection. The Imperial Valley region occasionally experiences periods of high winds. Predominant wind directions are westerly and west-southwesterly during all four seasons, and average annual daily wind speed is 4.1 miles per hour (CARB, 1999).

A common atmospheric condition known as a temperature inversion affects air quality in the ISDRA. During an inversion, air temperatures become warmer with increasing height rather than cooler. The presence of the Pacific high-pressure cell can cause the air mass aloft to sink. As the air descends, compressional heating warms it to a temperature higher than the air below. This highly stable atmospheric condition is called a subsidence inversion. The boundary between the layers of air acts as a temperature inversion that traps pollutants below it. The inversion layer can persist for 1 or more days, causing air stagnation and buildup of pollutants. Highest or worst-case ozone levels are often associated with the presence of this type of inversion.

Subsidence inversions are common from November through June, but appear to be relatively absent July through October.



**TABLE 3.11-2 AVERAGE MONTHLY TEMPERATURES AND PRECIPITATION FOR  
IMPERIAL, CA, 1971-2000**

MONTH	IMPERIAL COUNTY AIRPORT		
	MEAN DAILY TEMPERATURES		MEAN MONTHLY PRECIPITATION (INCHES)
	MAXIMUM (°F)	MINIMUM (°F)	
January	69	42	0.42
February	74	46	0.24
March	78	50	0.22
April	85	55	0.11
May	93	62	0.01
June	102	69	0.00
July	107	78	0.10
August	105	77	0.31
September	101	72	0.26
October	91	61	0.21
November	78	49	0.23
December	70	42	0.29
Absolute extreme temperatures	119	23	2.40 (total)

Reference: Imperial County, 2001b.

### 3.11.2 Health Effects of Criteria Air Pollutants

Air pollutants are recognized to have a variety of health effects on humans. Research by the CARB shows that exposure to high concentrations of air pollutants can trigger respiratory diseases such as asthma, bronchitis, and other respiratory ailments and cardiovascular diseases. A healthy person exposed to high concentrations of air pollutants may become nauseated or dizzy, may develop a headache or cough, or may experience eye irritation or a burning sensation or both in the chest. Ozone is a powerful irritant that attacks the respiratory system, leading to the damage of lung tissue. Inhaled particulate matter, nitrogen dioxide, and sulfur dioxide can directly irritate the respiratory tract, constrict airways, and interfere with the mucous lining of the airways. When it is absorbed into the bloodstream, carbon monoxide can endanger hemoglobin, the oxygen-carrying protein in blood, by reducing the amount of oxygen that reaches the heart, brain, and other body tissues. When air pollutant levels are high (a common occurrence in Southern California), children, elderly people, and people with respiratory problems are advised to remain indoors. Outdoor exercise also is discouraged because strenuous activity may cause shortness of breath and chest pains. A brief discussion of the criteria pollutants and their effects on human health and the environment is provided in Table 3.11-3.



## Affected Environment

**Table 3.11-3 Criteria Air Pollutants and Their Effects on Human Health and the Environment**

PHYSICAL CHARACTERISTICS	HEALTH EFFECTS	ENVIRONMENTAL EFFECTS
CO is a colorless and odorless and at high levels is a poisonous gas. It is a component of motor vehicle exhaust. Peak CO concentrations typically occur during the colder months of the year and nighttime inversion conditions.	Exposure to CO reduces oxygen delivery to the body's organs and tissues. Elevated levels are dangerous to those who suffer from cardiovascular disease. CO can be poisonous, can cause visual impairment, reduce work capacity and manual dexterity, and inhibit learning ability.	None.
Ground-level ozone (the primary constituent of smog) is not emitted directly into the air but is formed by the reaction of volatile organic hydrocarbons (VOCs) and nitrogen oxides (NOx) in the presence of heat and sunlight.	Exposure to ambient ozone has been linked to increased hospital admissions and emergency room visits for respiratory causes, including respiratory infection, asthma, significant decreases in lung function, chest pain, and cough.	Ozone also affects vegetation and ecosystems, leading to reductions in agricultural and commercial forest yields, reduced growth and survivability of tree seedlings, and increased plant susceptibility to disease, pests, and other environmental stresses (e.g., harsh weather).
NO <sub>2</sub> is a reddish brown, highly reactive gas. The major sources of man-made NOx emissions are high-temperature combustion processes. Home heaters and gas stoves also produce substantial amounts of NO <sub>2</sub> in indoor settings.	Exposures to NO <sub>2</sub> may reduce airway and lung function, increase respiratory illnesses in children, and increase susceptibility to respiratory infection. Atmospheric transformation of NOx can lead to the formation of ozone and PM, both of which are associated with adverse health effects.	NO <sub>2</sub> is a precursor of acid rain and is linked to a wide range of environmental effects, including changes in the composition and competition of some species of vegetation, visibility impairment, acidification of freshwater bodies, eutrophication of estuarine and coastal waters, and increases in levels of toxins harmful to fish and other aquatic life.
SO <sub>2</sub> is formed when fuel containing sulfur (mainly, coal and oil) is burned, and during metal smelting and other industrial processes. The highest concentrations of SO <sub>2</sub> occur in the vicinity of large industrial facilities.	Exposure to SO <sub>2</sub> can result in temporary breathing impairment, reduced lung function, wheezing, chest tightness, or shortness of breath, respiratory illness, alterations in the lungs' defenses, and aggravation of existing cardiovascular disease.	SO <sub>2</sub> is a major precursor of acid rain, which is associated with the acidification of soils, lakes, and streams, accelerated corrosion of buildings and monuments, and reduced visibility.
PM consists of a mixture of airborne solid particles and liquid droplets that originate from both man-made and natural sources. Fine particles (PM <sub>2.5</sub> ) are generally emitted from fuel combustion sources. Coarse particles (PM <sub>10</sub> ) are generally emitted from sources that cause wind-blown or entrained dust. SO <sub>x</sub> , NO <sub>x</sub> , and VOC also interact with compounds in the air to form PM.	Inhalable PM can accumulate in the respiratory system and is associated with numerous health effects, including the aggravation of respiratory conditions (asthma), increased hospital admissions and emergency room visits for heart and lung disease, increased respiratory symptoms, decreased lung function, and even premature death.	PM is the major cause of reduced visibility in many parts of the United States. Airborne particles also can cause damage to paints and building materials.
Pb emissions to the atmosphere were formerly dominated by automotive sources. As a result of the elimination of leaded gasoline, metals processing facilities are currently the primary source of Pb emissions. The highest air concentrations of Pb are found in the vicinity of smelters and battery manufacturers.	Exposure to Pb occurs mainly through inhalation and ingestion pathways. It accumulates in the blood, bones, and soft tissues. Pb can adversely affect the kidneys, liver, nervous system, and other organs. Excessive exposure to Pb may cause neurological impairments, such as seizures, mental retardation, behavioral disorders, damage to the nervous systems of fetuses and young children, and may be a factor in high blood pressure and subsequent heart disease.	Lead can also be deposited on the leaves of plants, presenting a hazard to grazing animals.



### 3.11.3 Toxic Air Contaminants

The federal and state laws and regulations also define a group of pollutants called “hazardous air pollutants,” “toxic air contaminants,” or “air toxics.” These pollutants are regulated by the National Emissions Standards for Hazardous Air Pollutants (NESHAPS) section of the federal Clean Air Act; various state laws and regulations; state air toxics acts (e.g., the AB 1807, AB 2588, and SB 1731 programs); and Imperial County Air Pollution Control District (APCD) Regulations XI and XII. In urban areas, toxic air contaminants are a concern because of the concentration of people living close to large sources of emissions. The combination of toxic emissions from vehicles, industry, and multiple area sources creates an unhealthy mix that varies based on geography, industry, population, and other factors. Exposure to toxic air pollutants may cause or contribute to cancer, birth defects, genetic damage, and other adverse health effects.

In Imperial County, the Imperial County APCD is the agency responsible for protecting public health and welfare through the administration of federal and state air quality laws, regulations, and policies. Included in the tasks for APCD are the monitoring of air pollution, the preparation of the State Implementation Plan (SIP) for the San Diego Air Basin (SDAB), and the promulgation of Rules and Regulations. The SIP included strategies and tactics to be used to attain the federal O<sub>3</sub> standard in Imperial County. The elements are taken from the Air Quality Attainment Plan, the APCD plan for attaining the state O<sub>3</sub> standard, which is more stringent than the federal standard (Imperial County APCD, 1991). The Rules and Regulations include procedures and requirements to control the emission of pollutants and to prevent adverse impacts.

### 3.11.4 Federal Clean Air Act Conformity

The CAA Amendments of 1977 (42 United States Code [USC] 7401, et seq.) state that the federal government is prohibited from engaging in, supporting, providing financial assistance for, licensing, permitting, or approving any activity that does not conform to an applicable SIP. Federal actions related to transportation plans, programs, and projects developed, funded, or approved under 23 USC or the Federal Transit Act (49 USC 1601, et seq.) are covered under separate regulations for Transportation Conformity.

In the 1990 CAA Amendments, EPA included provisions requiring federal agencies to ensure that actions undertaken in nonattainment or attainment-maintenance areas are consistent with applicable SIPs. Imperial County APCD has adopted Rule 1501, Conformity of General Federal Actions. The process of determining whether or not a federal action is consistent with applicable SIPs is called “conformity.” The general conformity rules establish a process to demonstrate that federal actions would be consistent with applicable SIPs and would not cause or contribute to new violations of the NAAQS, increase the frequency or severity of existing violations of the NAAQS, or delay the timely attainment of the NAAQS. The emission thresholds that trigger requirements of the conformity rule are called *de minimis* levels.



### 3.11.5 Compliance with Air Quality Standards

A determination of conformity with the applicable SIP is required for each pollutant where the total direct and indirect emissions in a nonattainment or attainment-maintenance area caused by the action would exceed *de minimis* levels. The General Conformity *de minimis* thresholds are defined in 40 CFR 93.153(b) and in Rule 1501. In addition, the project proponent must demonstrate that the total direct and indirect emission increases associated with the action will not be regionally significant; that is, they will not represent 10 percent or more of an emission inventory or emissions budget of an area.

The General Conformity rules do not apply to federal actions in areas designated as nonattainment of the CAAQS only.

Under the 1977 Amendments to the CAA, those states with air quality that did not achieve the NAAQS were required to develop and maintain SIPs. These plans constitute a federally enforceable definition of the approach of the state (or “plan”) and schedule for the attainment of the NAAQS. Air quality management areas are designated as “attainment,” “nonattainment,” or “unclassified,” depending on whether or not they achieve the NAAQS and CAAQS. In addition, California can also designate areas as “transitional.” It is important to note that, because the NAAQS and CAAQS are different in many cases, it is possible for an area to be designated as attainment by EPA (meets the NAAQS) and “nonattainment” by the CARB (does not meet the CAAQS) for the same pollutant. Also, an area can be designated as attainment for one pollutant (e.g., NO<sub>2</sub>) and nonattainment for others (O<sub>3</sub> and PM<sub>10</sub>).

Areas that were designated as attainment in the past, but have since achieved the NAAQS, are further classified as “attainment-maintenance.” The maintenance classification remains in effect for 20 years from the date that the area is determined by EPA to meet the NAAQS. There are numerous classifications of the nonattainment designation, depending on the severity of nonattainment. For example, the O<sub>3</sub>-nonattainment designation has seven subclasses: transitional, marginal, moderate, serious, severe-15, severe-17, and extreme. Areas that lack monitoring data are designated as unclassified areas and treated as attainment areas for regulatory purposes.

The SSAB, which coincides geographically with the desert region of Imperial and Riverside Counties, currently meets the federal and state standards for all pollutants except O<sub>3</sub> and PM<sub>10</sub>. The SSAB is currently classified as a federal and state “serious” O<sub>3</sub>-nonattainment area and nonattainment area for PM<sub>10</sub>. ISDRA is located within an attainment area for the federal and state CO, NO<sub>2</sub>, SO<sub>2</sub>, and Pb standards. The City of Calexico, located at the California/Mexico International border, is in a nonattainment area for CO.

CARB monitors ambient air quality at approximately 250 air monitoring stations across the state. Air quality monitoring stations usually measure pollutant concentrations 10 feet above ground level; therefore, air quality is often referred to in terms of “ground-level” concentrations. Factors affecting ground-level pollutant concentrations include the rate at which pollutants are



emitted to the atmosphere, the height from which they are released, the physical combination of emissions from various sources, the formation of secondary pollutants, the interaction of pollutants with topographic features, and meteorological conditions. Meteorological parameters that affected pollutant dispersion the most are wind speed and direction, atmospheric stability, mixing height, and temperature.

Ambient criteria air pollutant concentration in the SSAB are measured at six air quality monitoring stations operated by Imperial County APCD and CARB. The nearest air quality monitoring station operating in the vicinity of the Plan Area is a monitoring station located at Calexico East, approximately 20 miles to the southwest of the Plan Area. The station monitors O<sub>3</sub>, CO, NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>10</sub>, and Pb. Data for the years 1996 to 2000 are summarized in Table 3.11-4. Over the last 5 years, the federal and state standards for NO<sub>2</sub>, SO<sub>2</sub>, and Pb have not been exceeded at the Calexico East Station. For the last 3 years, the federal and state 24-hour and annual standards for PM<sub>10</sub> were exceeded every year. Ozone levels at the Calexico East Station exceeded federal and state standards in every year from 1996 to 2000.

### 3.11.6 Sources of Regional and Local Pollution

The most significant sources of O<sub>3</sub>, NO<sub>2</sub>, CO, and PM<sub>10</sub> in SSAB are automobiles and OHVs. The greatest source (87 percent) of PM<sub>10</sub> is road dust. Ozone is formed by the reaction of ROG and NO<sub>x</sub>, which are largely combustion products from gas and diesel engines. Ozone is a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production. In Imperial County, 68 percent of the 310 tons per day of ROG emitted come from mobile sources (i.e., automobiles, trucks, marine vessels, aircraft, and heavy equipment). For NO<sub>x</sub>, 88 percent of the 240 tons emitted daily are from mobile sources. Some ozone levels in excess of the federal and state standards can be traced to emissions of ozone precursors transported by wind from the South Coast Air Basin and from Mexico. Computer modeling of smog formation has shown that a reduction of approximately 25 percent each of NO<sub>x</sub> and ROG would allow the SSAB to meet the federal O<sub>3</sub> standard on days when there is no substantial transport of pollution from the South Coast Air Basin or other airshed (District, 1999).

High concentrations of PM<sub>10</sub> in many areas in Imperial County result from wind action. The wind picks up particles from disturbed and undisturbed surfaces, recreational travel on paved and unpaved roadways, construction and demolition activities, and farming operations such as crop burning. These particles can remain suspended in the air for long periods and can travel a great distance. The principal health effect of airborne particulate matter is on the respiratory system.



## Affected Environment

**Table 3.11-4 Ambient Air Quality Summary, Calexico – East Monitoring Station**

POLLUTANT	AVERAGING TIME	CALIFORNIA AIR QUALITY STANDARDS	FEDERAL PRIMARY STANDARDS	MAXIMUM CONCENTRATIONS <sup>(A)</sup>					NUMBER OF DAYS EXCEEDING FEDERAL STANDARD <sup>(B)</sup>					NUMBER OF DAYS EXCEEDING STATE STANDARD <sup>(B)</sup>				
				1996	1997	1998	1999	2000	1996	1997	1998	1999	2000	1996	1997	1998	1999	2000
Oxidants (Ozone)	1 hr	0.09 ppm	0.12 ppm	0.162	0.121	0.236	0.156	0.108	3	0	1	3	0	22	6	27	13	7
	8 hrs (c)	N/A	0.08 ppm	0.117	0.092	0.101	0.110	0.079	12	2	13	5	0	N/A	N/A	N/A	N/A	N/A
Carbon Monoxide	1 hr	20 ppm	35 ppm	22.0	21.0	18.4	14.0	17.6	0	0	0	0	0	1	1	0	0	0
	8 hrs	9 ppm	9 ppm	8.74	16.29	13.00	9.37	11.30	0	2	3	0	1	0	4	3	1	1
Nitrogen Dioxide	1 hr	0.25 ppm	N/A	0.072	0.091	0.105	0.110	0.124	N/A	N/A	N/A	N/A	N/A	0	0	0	0	0
	Annual	N/A	0.053 ppm	0.007	0.011	0.011	0.013	0.012	0	0	0	0	0	N/A	N/A	N/A	N/A	N/A
Sulfur Dioxide	1 hr	0.25 ppm	N/A	0.036	0.035	0.026	NM	NM	N/A	N/A	N/A	N/A	N/A	0	0	0	N/A	N/A
	24 hrs	0.05 ppm	0.14 ppm	0.010	0.015	0.009	NM	NM	0	0	0	N/A	N/A	0	0	0	N/A	N/A
	Annual	N/A	0.03 ppm	0.001	0.002	0.003	NM	NM	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PM <sub>10</sub>	24 hrs	50 µg/m <sup>3</sup>	150 µg/m <sup>3</sup>	NM	NM	568	1,342	1,613	N/A	N/A	10	20	32	N/A	N/A	44	51	57
	Annual	30 µg/m <sup>3</sup>	50 µg/m <sup>3</sup>	NM	NM	107.8	168.7	238.8	N/A	N/A	1	1	1	N/A	N/A	1	1	1
Lead	Quarterly Average	N/A	1.5 µg/m <sup>3</sup>	0.05	0.03	0.03	0.02	0.02	0	0	0	0	0	N/A	N/A	N/A	N/A	N/A

Source: AIRData, U.S. EPA Office of Air Quality Planning and Standards: Imperial County, CA 1996 - 2000. EPA website: <http://www.epa.gov/air/data>

### Notes:

- (a) Concentration units for ozone, carbon monoxide, nitrogen dioxide, and sulfur dioxide are in parts per million (ppm). Concentration units for PM<sub>10</sub> and lead are in micrograms per cubic meter (µg/m<sup>3</sup>).
- (b) For annual standards, a value of 1 indicates that the standard has been exceeded.
- (c) The number of days above the 8-hour ozone standard is not the number of violations of the federal standard for the year. The number of days is presented for display purposes until the EPA completes the 8-hour ozone monitoring evaluation program.

NM = Not Monitored.

N/A = Not applicable.



Emissions sources associated with the existing use of ISDRA consist of combustion emissions from OHVs; small internal-combustion generator engines; recreational vehicles and on-road motor vehicles (commuting to, delivery at, traveling inside, and departing from the site); and fugitive dust emissions entrained from vehicles travelling over paved and unpaved surface. The principal sources of criteria pollutant emissions are automobiles and recreational vehicles.

The South Coast Air Quality Management District (SCAQMD) recently released a draft report, referred to as the *Multiple Air Toxics Exposure Study* (SCAQMD, 1999), discussing the exposure risk to toxic air contaminants in Southern California. The report stated that about 70 percent of all estimated human health risk to toxic air contaminants is attributed to diesel exhaust (particulate emissions); about 20 percent to other toxic compounds associated with mobile sources such as benzene and 1,3-butadiene; and about 10 percent to stationary sources. Existing emitters of toxic air pollutants include automobiles, trucks, recreational vehicles, portable fuel storage tanks, and OHV rental stations.



## 3.12 HAZARDOUS MATERIALS

This section evaluates the storage and use of hazardous materials and the storage and disposal of nonhazardous and hazardous waste within the ISDRA. In addition, a discussion of applicable environmental regulations and the results from a search of applicable federal and State of California environmental databases is provided. Existing effects to human health and the environment are discussed to provide a baseline from which the proposed project alternatives can be analyzed.

### 3.12.1 Current and Past Uses of Adjoining Property

As described in Section 3.5 (Land Use and Ownership), land uses proximate or adjacent to the ISDRA Plan Area include a number of nonrecreation applications. These land uses include BOR-withdrawn lands, military target areas, sand and gravel sales activities, geothermal leases, oil and gas leases, mining, and utility transportation rights-of-way. Although certain of these land uses have an unquantified potential for minor hazardous material releases or localized contamination, they are not of the type that typically would be expected to pose a substantial hazardous material-related threat to the surrounding environment.

### 3.12.2 Environmental Regulations

The storage and use of hazardous materials is governed by federal, state, and local laws, ordinances, regulations, and standards (LORS). Applicable laws and regulations that address the use and storage of hazardous materials are discussed below along with applicable LORS that address the storage, transportation, and disposal of nonhazardous and hazardous waste.

#### 3.12.2.1 CERCLA

Hazardous materials are governed under existing federal regulation through the Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund. This law provides broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. Title III of SARA, an amendment to CERCLA, requires states to establish a process for developing local chemical emergency preparedness programs and to receive and disseminate information on hazardous materials present at facilities in local communities.

#### 3.12.2.2 RCRA

The federal statute that controls both nonhazardous and hazardous waste is the Resource Conservation and Recovery Act (RCRA), 42 USC Sections 6901, et seq., and its implementing regulations found at 40 CFR 260, et seq. Subtitle D makes the regulation of nonhazardous waste the responsibility of the states; federal involvement is limited to establishing minimum criteria that prescribe the best practicable controls and monitoring requirements for solid waste disposal facilities. Subtitle C controls the generation, transportation, treatment, storage, and disposal of hazardous waste through a comprehensive “cradle to grave” system of hazardous waste management techniques and requirements. It applies to all states and to all generators of hazardous waste (above certain levels of waste produced). EPA is responsible for



implementing the law. The State of California laws for managing hazardous wastes is in Title 22 of the California Code of Regulations (CCR).

**3.12.2.3 Health and Safety Code Section 25500 (Waters Bill)**

California Health and Safety Code, Section 25500, et seq., and the regulations to the law in 19 CCR Section 2620, et seq. require local governments to regulate local business storage of hazardous materials in excess of certain quantities. The law also requires that entities storing hazardous materials be prepared to respond to releases. The threshold quantities for hazardous materials are 55 gallons for liquids, 500 pounds for solids, and 200 cubic feet for compressed gases measured at standard temperature and pressure.

**3.12.2.4 Health and Safety Code Section 25531 (La Follette Bill)**

California Health and Safety Code, Section 25531, et seq., regulates the registration and handling of acutely hazardous materials. Acutely hazardous materials are any chemicals designated as an extremely hazardous substance by EPA as part of its implementation of Superfund Amendments and Reauthorization Act (SARA) Title III.

**3.12.2.5 Aboveground Petroleum Storage Act**

California Health and Safety Code Sections 25270 to 25270.13 is intended to ensure compliance with the federal Clean Water Act. The law applies if a facility has an aboveground storage tank (AST) with a capacity greater than 660 gallons or a combined AST capacity greater than 1,320 gallons, and if there is a reasonable possibility that the tank(s) may discharge oil in "harmful quantities" into navigable waters or adjoining shore lands.

**3.12.2.6 Safe Drinking Water and Toxics Enforcement Act (Proposition 65)**

This California law identifies chemicals that cause cancer and reproductive toxicity, informs the public, and prevents discharge of the chemicals into sources of drinking water. Lists of the chemicals of concern are published and updated periodically. The Act is administered by the California Office of Environmental Health Hazard Assessment.

**3.12.2.7 Solid Waste**

Nonhazardous solid waste is regulated by the California Integrated Waste Management Act (CIWMA) of 1989, found in Public Resources Code (PRC) Sections 40000, et seq. This law provides an integrated statewide system of solid waste management by coordinating state and local efforts in source reduction, recycling, and land disposal safety. Counties are required to submit Integrated Waste Management Plans to the state. This law directly affects Imperial County and the solid waste hauler and disposal company that will collect nonhazardous waste. It also affects BLM to the extent that hazardous wastes are not to be disposed with solid waste.

Nonhazardous solid and liquid waste generated within the ISDRA are placed into one of three dumpsters located within the Plan Area. The dumpsters are removed by a waste removal company. The portion of the waste that is recyclable will be recovered, and the remaining waste will be deposited in a Class III landfill. The quantity of this waste is currently unknown. Solid and liquid hazardous materials and petroleum products are not permitted to be placed in the dumpsters.



### 3.12.2.8 Imperial County

Local regulations relating to hazardous materials in Imperial County are managed by the environmental health agency of the county.

### 3.12.3 Environment al Database Results

A review of available environmental records was performed to determine and identify known hazards associated with the Plan Area and adjacent properties. An electronic database report (EDR) was obtained from Fidelity Information Services, prepared in accordance with the American Society for Testing and Materials (ASTM) practices, which include all reasonably ascertainable environmental records including state and federal sources. The ASTM list of records, including the approximate minimum search distances and the resulting number of sites found within the ASTM search distance, measured from the perimeter of the Plan Area, are shown in Table 3.12-1. Descriptions of the databases searched below are provided in the following paragraphs.

For the above-referenced ASTM search parameters, the EDR did not identify any known sites of environmental significance within the ASTM standard search distances.

The following is a brief summary of each database searched that resulted in known sites within or nearby the Plan Area. The sites are plotted in Figure 3.12-1.

**Facility Index System (FINDS)** – The FINDS database is an inventory of all facilities that are regulated or tracked by EPA. These facilities are assigned an identification number that serves as a cross-reference for other databases in the EPA program system. A review of the database results indicates two FINDS sites were identified within the survey area. These sites are as follows:

- Santa Fe Pacific Minerals, Mesquite Mine. The site is located along SR-78 in the eastern portion of the Plan Area.
- Arid Operations, Inc. The site is located along SR-78 in the eastern portion of the Plan Area.

**Table 3.12-1 Site Distribution Summary – Imperial Hills Sand Dunes Recreation Area**

AGENCY/DATABASE – TYPE OF RECORDS	WITHIN 1/8 MILE	1/8 TO 1/4 MILE	1/8 TO 1/2 MILE	1/2 TO 1 MILE
<b>A) Databases searched to 1 mile</b>				
EPA – NPL. National Priority List.	0	0	0	0
EPA – CORRACTS. (RCRA Corrective Action [w/o TSD]).	0	0	0	0
State – SPL. State equivalent priority list.	0	0	0	0
<b>B) Databases searched to 1/2-mile</b>				
EPA – RCRA TSD. RCRA permitted treatment, storage, disposal facilities.	0	0	0	-
State – SCL. State equivalent CERCLIS list.	0	0	0	-
EPA – CERCLIS/NFRP. Sites currently or formerly under review by EPA.	0	0	0	-



**Table 3.12-1 Site Distribution Summary – Imperial Hills Sand Dunes Recreation Area**

<b>AGENCY/DATABASE – TYPE OF RECORDS</b>	<b>WITHIN 1/8 MILE</b>	<b>1/8 TO 1/4 MILE</b>	<b>1/4 TO 1/2 MILE</b>	<b>1/2 TO 1 MILE</b>
STATE REG CO – LUST. Leaking Underground Storage Tanks.	0	0	0	-
STATE/REG/CO – SWLF. Permitted as SWLF, incinerators, or transfer stations.	0	0	0	-
STATE – DEED RSTR. Sites with deed restrictions.	0	0	0	-
STATE – CORTESE. State index of properties with hazardous waste.	0	0	0	-
STATE – TOXIC PITS. Toxic Pits cleanup facilities.	0	0	0	-
STATE – FINDS – Facility Index System.	2	0	0	-
USGS/STATE – WATER WELLS. Federal and State Drinking Water Sources.	4	0	0	-
US EPA TRIS – Toxic Release Inventory Database.	0	0	0	-
<b>C) Databases searched to 1/4-mile:</b>				
State – UST. Registered underground storage tanks.	0	0	-	-
State – AST. Registered aboveground storage tanks.	1	0	-	-
<b>D) Databases searched to 1/8-mile:</b>				
EPA – GNRTR. RCRA registered small or large generators of hazardous waste.	2	-	-	-
EPA - RCRA Violations – RCRA violations/enforcement actions.	0	-	-	-
STATE – SPILLS. State spills list.	2	-	-	-
<b>Total Sites</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>

The EDR also includes a category of “unmapped” sites. Sites are included in the unmapped category when the database information is not accurate enough to positively identify the site locations. The database report for the site identified two unmapped sites, which were identified from the FINDS database report. The unmapped facilities are noted as:

- United States Department of Interior Laguna Field Office U.S. Government, RTE 1 Box 201, Winterhaven, CA 92283
- Glamis Radio Repeater, Black Mountain, Glamis, CA 92248



**United States Geological Survey Wells /WATER WELLS** – The Groundwater Site Inventory (GWSI) database is maintained by the United States Geological Survey (USGS). The database contains information for over 1 million wells and other sources of groundwater that the USGS has studied, used, or documented during research. A review of the database results indicate four USGS WATER WELLS were identified within the survey area. These WATER WELLS are used by the USGS for research purposes, and are located in the northern, eastern, and southern portions of the Plan Area.

**State-of-California AST** – The database maintains a list of aboveground storage tanks. A review of the database results indicate one STATE AST site was identified within the survey area. The site is as follows:

- Newmont Gold Company. This site is located along SR-78 in the eastern portion of the Plan Area.

**GNRTR** – The database maintains a list of RCRA-registered small or large generators of hazardous waste. A review of the database results indicates two GNRTR sites were identified within the survey area. The sites are as follows:

- Santa Fe Pacific Minerals. The site is a registered small quantity generator and is located along SR-78 in the eastern portion of the Plan Area.
- Arid Operations, Inc. The site is a registered small quantity generator and is located along SR-78 in the eastern portion of the Plan Area.

**SPILLS** – The database maintains a list of spills from the Emergency Response Notification System (ERNS). The ERNS is a national computer database system that is used to store information on the sudden or accidental or both release of hazardous substances, including petroleum, into the environment. The ERNS contains preliminary information on specific releases, including the spill location, the substance released, and the responsible party. A review of the database results indicates two ERNS sites were identified within the survey area.

- On July 3, 1991, 50 gallons of sodium cyanide solution were spilled at a site located along SR-78 in the eastern portion of the Plan Area. The origin of the spill was unknown, and no waterway was affected by the spill. Based on the EDR provided by Fidelity Information Services, no further monitoring or remedial action has been required. Therefore, this site has a low potential to affect existing conditions in the ISDRA Plan Area.
- On June 26, 2000, 9,900 pounds of hydrogen cyanide emissions were released to the atmosphere at a site located along SR-78 in the eastern portion of the Plan Area. No other media was affected by the release. The origin of the release was not given. Due to the time that has elapsed since the release, the site has a low potential to affect existing conditions at the ISDRA. Based on the EDR provided by Fidelity Information Services, no further monitoring or remedial action has been required. Therefore, this



site has a low potential to affect existing conditions in the ISDRA Plan Area.



### 3.13 GEOLOGY, ENERGY, AND MINERAL RESOURCES

This section establishes the existing geologic conditions, including general seismicity, as well as energy and mineral resources. The local and regional geologic setting of the Algodones Dunes Area was researched using previous environmental assessment reports, soil reports, federal geographic information system (GIS) database maps, and technical research papers on the California desert.

#### 3.13.1 Soil and Geologic Conditions

The soil and geologic conditions of the Plan Area are summarized in this section, including a general description of the geologic setting earth materials and the geologic (dune) structure. The geologic study of the Plan Area includes evaluation of surface soils.

##### 3.13.1.1 General Description of Geologic Setting

The Imperial Sand Dunes (also known as the Algodones Sand Dunes) are the largest mass of sand dunes in California. This dune system extends for more than 40 miles along the eastern edge of the Imperial Valley agricultural region in a band averaging 5 miles in width. It is roughly bordered on the west by the Coachella Canal, which delivers Colorado River water to the fertile agricultural valley to the north. A major east-west route of the UPRR skirts the eastern edge.

The dune system is situated on a relatively flat plain that has an elevation of approximately 50 feet above sea level. On the west, the plain is called East Mesa (because it is east of Imperial Valley). On the east, the plain is called Pilot Knob Mesa.

The dunes reach heights of 300 feet above the plain, and include classic examples of several different types of dunes. The sand dunes are thought originally to have been beach sands of ancient Lake Cahuilla, which occupied the Imperial Valley at a time when the Colorado River emptied into it instead of the Gulf of California. Unlike some major dune systems that have formed next to a mountain range, the Imperial Dunes have formed here primarily as a result of opposing seasonal winds. Winter winds come from the northwest, but often reverse to the southeast in summer. The stronger winter winds are slowly pushing the dune system southeastward.

The east and west sides of the dunes system differ substantially in character. West side sands are composed of material that is generally heavier and coarser than the lighter, finer sands carried further east in the prevailing winds. The coarse sands form the largest, tallest dunes, located in the western two-thirds of the dune system. These constitute the "primary dunes." The tallest dunes are found toward the center of the overall dune mass, in the eastern half of the primary dune area. East of the primary dunes are the "secondary dunes," smaller dunes composed of finer sands and having more vegetation cover (BLM, 1987).



### 3.13.1.2 Geologic Structure

The Plan Area includes a great variety of dune forms, but is dominated by prominent transverse ridges. Some consider the Algodones Dunes to be a chain of over-size barchans, whose horns join. Barchan dunes are crescent in shape, develop on a flat surface, with a moderate sand supply transported mostly by unidirectional winds. The dominant sand-driving winds in this area blow from the northwest to the southeast, parallel to the gross trend of the Algodones Dunes. Barchans can advance across the desert, horns first, at rates varying from a few inches to tens of feet per year, depending upon the size of the dune and the amount of erosion due to wind, water, and vehicles. The source of the dunes is most likely from the northwest, developed from a large plume of sand driven inshore from the beaches of ancient Lake Cahuilla, which once occupied the present location of the Salton Basin.

In the southwest part of the Algodones Dune area are several long (about 6 miles) examples of seif dunes. Seif dunes are formed when the sand-driving winds come from several directions, but within narrow limits, 15 to 20 degrees, and the barchan form becomes elongate and hook-shaped, forming the linear sand ridges or "seif" dunes, as cross winds come from wider and wider angles. These linear ridges rise approximately 30 feet or so above the dune mass and form distinct ridges that curve and fade into the main dune mass to the north.

Of all the California Dunes, the Algodones Dunes show the most evidence of age. They have a distinctive light brown color, much darker than younger pale gray or white sands of the Coachella Valley near Palm Springs toward the northwest. The darker color suggests that the Algodones Dunes have been around for a long time, probably dating back to the latter part of the Pleistocene, 10 to 20 thousand years ago, or longer (Norris-Sand Dunes of the California Desert).

Heavy vehicle use in the Algodones Dunes has modified some of the smaller dune forms (Norris, Sand Dunes of California). One of the most interesting dune areas geologically is the southern portion of the Plan Area, on either side of I-8. It is in this area that the greatest array of dune forms occur. Vehicle disturbances change the small-scale dune forms, such as ripples, sand shears, and dune crests. Concentrations of heavier coarse-grained materials are apt to be displayed imperfectly as a result of vehicle disturbance unless strong winds have occurred just prior to observation of the dunes.

The Algodones Dunes have a scientific value and are used as a teaching and research area. The southern portion of the study area has the greatest array of geological features. North of I-8, the finest examples of seif dunes occur, as well as some interesting elongate sand ridges extending from the mega-barchans.

### 3.13.1.3 Sand and Soils

A soils report was written for Imperial County by the U.S. Department of Agriculture Soil Conservation Service (October 1981). The geographic limits of the soil report investigation ended along the western edge of the Algodones Dunes Area. No detailed soil information was found for most of the Plan Area east of the western edge. Based on findings from the soil report, the



western edge of the study area is composed primarily of Rositas sands with lesser areas of Antho loamy fine sands/Holtville silty-clay loams.

The Rositas sands are distributed throughout the Plan Area. These sands range in properties from loamy fine sands, to fine sands, to medium sands. The larger-grained Rositas sands are mostly in the western, upwind section of the subject area with the finer sands located mostly on the eastern downwind side of the dunes area. Typically, the Rositas sands are stratified, with reddish yellow to light brown coloring. These sands are formed in alluvial or eolian deposits from distant sources. Typically, the surface layer of the Rositas soil is light brown, loamy, fine sand about 4 inches thick. The underlying material is pinkish and very pale brown sand to a depth of 60 inches and can have thin gravelly subsurface layers. In many places, there are soils that have a sandy profile and a few thin lenses of fine sandy loam, silt loam, or silty clay loam. Permeability is rapid, and available water capacity is low. Surface runoff is slow, and there is a high hazard of soil blowing and abrasion to young plants. The effective rooting depth is 60 inches or more.

The Antho loamy fine sands/Holtville silty-clay loams are found in smaller pocket areas, most of which lie south of SR-78 and just east of the Coachella Canal. These soils are deep and well drained and typically form in alluvial sediments of mixed sources. Surface textures are composed of fine sandy loam, silty loam sand, and silty-clay loam. Typically, the surface layer of this Antho/Holtville soil is reddish loamy fine sand about 13 inches thick. Underlying this is reddish yellow or pink fine sandy loam to a depth of 42 inches. Below this is stratified, contrasting material of finer or coarser texture. Permeability of the loamy sands is moderately rapid, and available water capacity is low to moderate. Permeability of the silty-clay loams is moderately slow, and available water capacity can be high. Surface runoff is slow, and the hazard of soil blowing for the sandy loam is high. The effective rooting depth is 60 inches or more. These soils have potential for irrigated farming with land leveling (USDOA, 1981).

### 3.13.1.4 Seismicity

Faults are fractures in the crust of the earth along which bedrock is displaced or offset as a result of pressures within the earth. An active fault is one where displacement has occurred within the last 11,000 years or so, which is a period in time that is referred to as the Holocene Epoch.

Earthquakes are vibrations of the earth caused by sudden movement of the bedrock on either side of an active fault. The vibration of the earth results when bedrock on either side of the fault breaks loose from its original position and then snaps into a new position. In the process of rebounding, vibrations called seismic waves are generated. The primary effect of earthquakes is the violent ground motion accompanying movement along a fault. Secondary effects include ground rupture; landslides; tsunamis (i.e., tidal waves); lurching; regional or local subsidence of the land; and liquefaction. Liquefaction is a geologic process in which soil that is saturated loses its strength or stiffness as a result of increased pore pressures resulting from ground shaking during earthquakes. Liquefaction is most likely to occur in



recent geologic deposits, especially sandy soils, that have a high groundwater table.

The Plan Area is located to the east of the zone of major historic recorded seismic activity in Southern California. The western portion of Southern California is more seismically active because of the basic differences in the geological environment between the western and eastern portions of Southern California. In addition, the number and length of the active faults decrease from west to east within the western portion of Southern California.

The Imperial Valley is at the southern end of the San Andreas fault system, probably the most studied and best known fault system in the United States. The San Andreas system transects the northeastern margin of the Imperial Valley approximately 60 miles northwest of the Plan Area. Other major Holocene Epoch faults within the region include several faults that parallel, or are “en echelon” to, the southern section of the San Andreas fault. Most notably, these faults are the reported East Mesa fault, the East Highline Canal lineament, the Imperial-Brawley Seismic Zone, the Superstition Hills fault (San Jacinto fault Zone), and the Elsinore fault. Some geologic references for the area also indicate the possible existence of a postulated fault (Sand Hills fault) beneath the Algodones Sand Dunes, which may represent the inactive eastern boundary of the Salton Trough spreading center. No evidence has been documented to indicate that the Sand Hills fault has been active in Holocene time. The active faults currently associated with the eastern boundary of the Salton Trough are now coincident with the East Mesa fault and possibly the East Highline Lineament (Imperial Environmental Impact Statement, 1997).

### 3.13.2 Energy Resources

As of 1987, several oil and gas leases had been issued, mainly in the class L (limited use) area of the central dunes, the Glamis/Gecko Open Area, and in the North Algodones Dunes Wilderness. Leasing took place within the WSA in 1981 and 1982, prior to a moratorium on WSA leasing. Development of oil and gas resources is low due to geologic conditions.

Two Known Geothermal Resource Areas (KGRAs) underlie the recreation area, the Glamis KGRA and the Dunes KGRA. Figure 3.13-1 shows these areas. The geothermal potential is considered fair for high temperature electrical power generation and excellent for low temperature applications. The Glamis KGRA occupies a corridor along SR-78, extending up to 2 miles north and 3 miles south of the highway. The northern portion of the “Glamis” KGRA extends into the North Algodones Dunes Wilderness. The “Dunes” KGRA occupies 16 sections of East Mesa and adjacent dunes in the southern portion of the Plan Area.

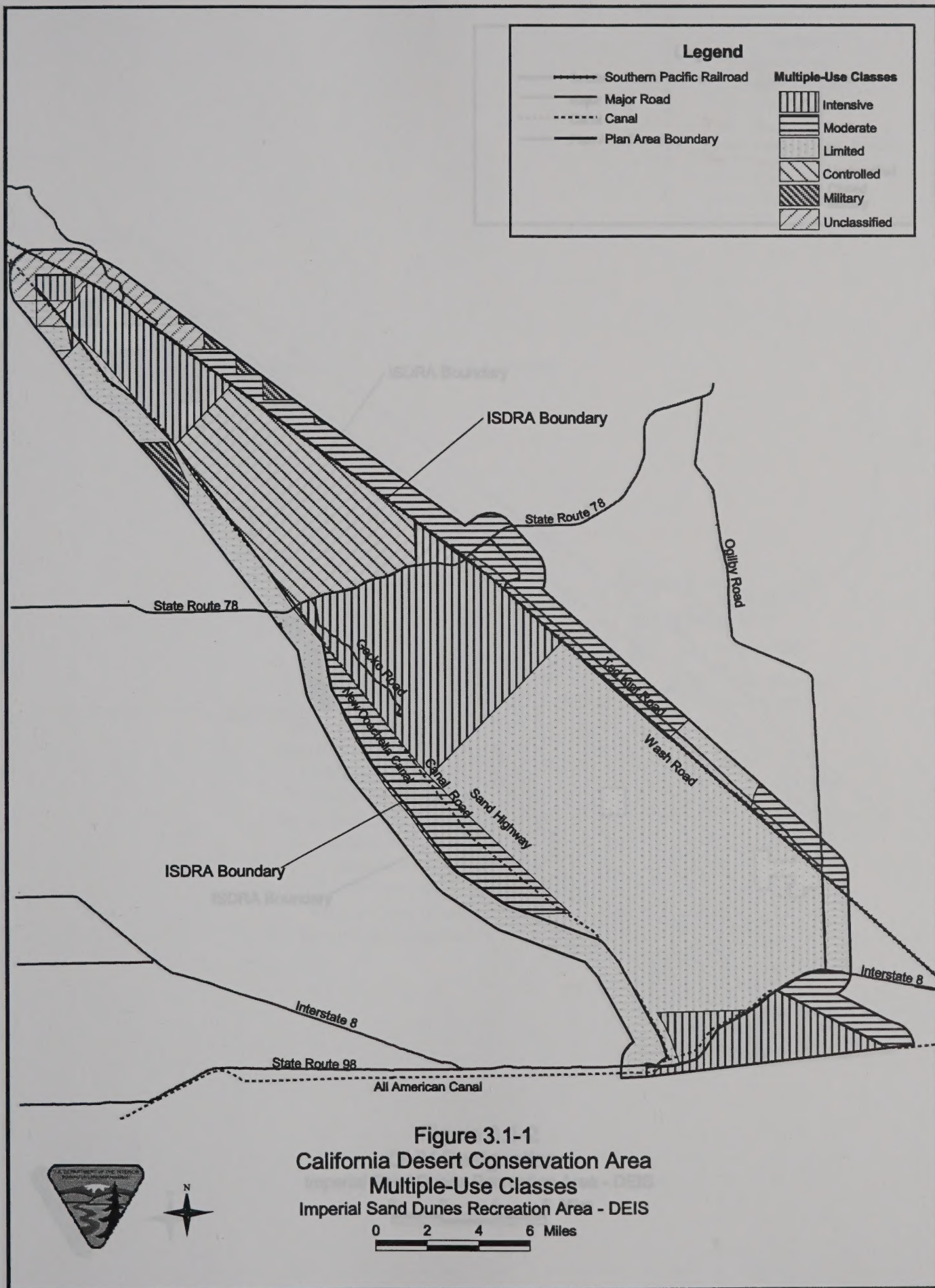
### 3.13.3 Mineral Resources

The principal mineral resources are sand and gravel. The blowsand of the main dune system is occasionally used for fill material. Alluvial sand and gravel deposits east of Glamis are extracted for road base material. Permits for the extraction of sand and gravel have been proposed for Class I land, not WSAs or Class L land. All sand and gravel sales activity is found on the Glamis-Boardmanville Class M lands. Mining claims are also located in the



Class M lands. No mineral extraction has occurred in these areas, and potential for practical extraction appears to be low (BLM, 1987; CDC, 1980).

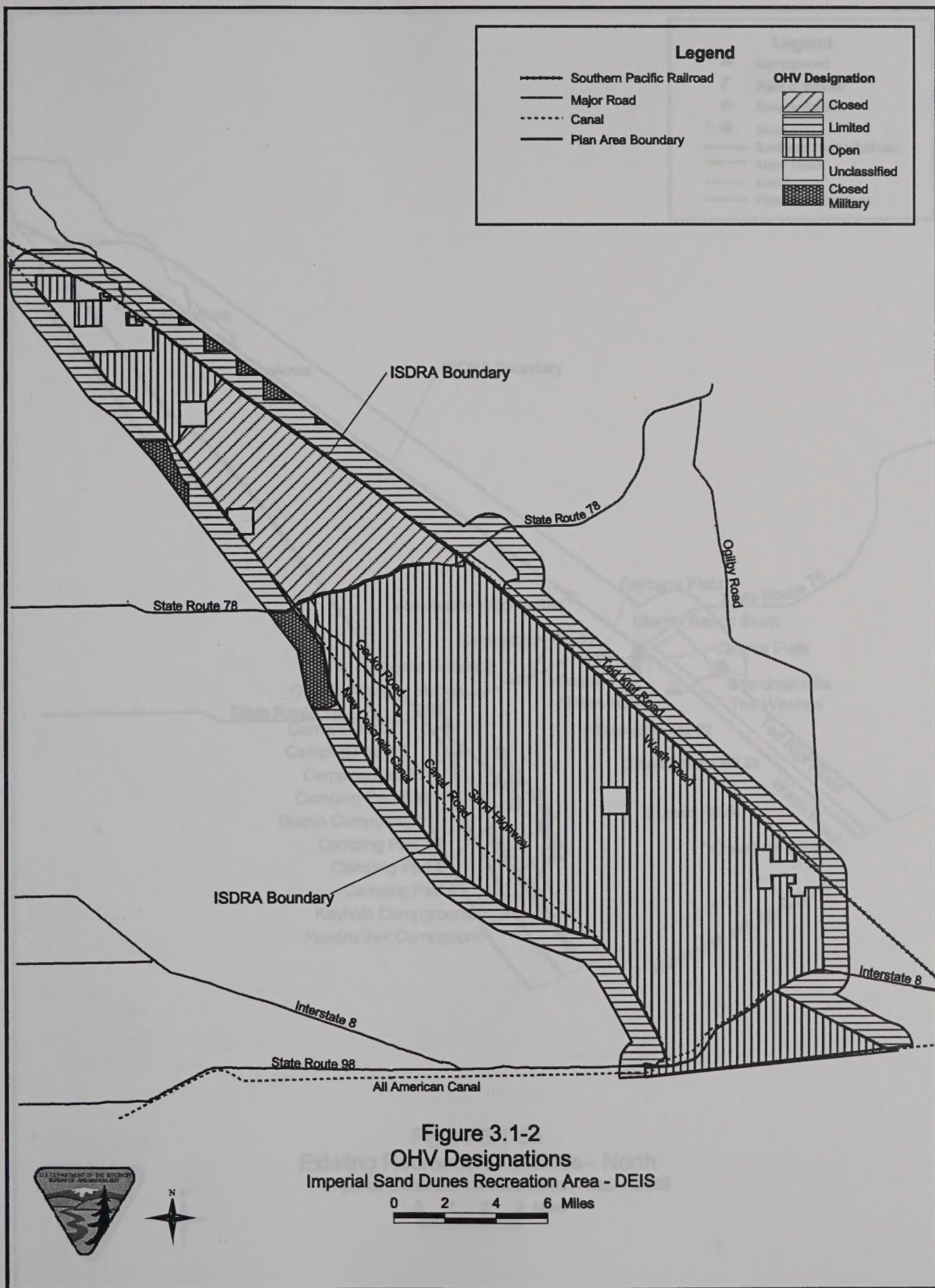








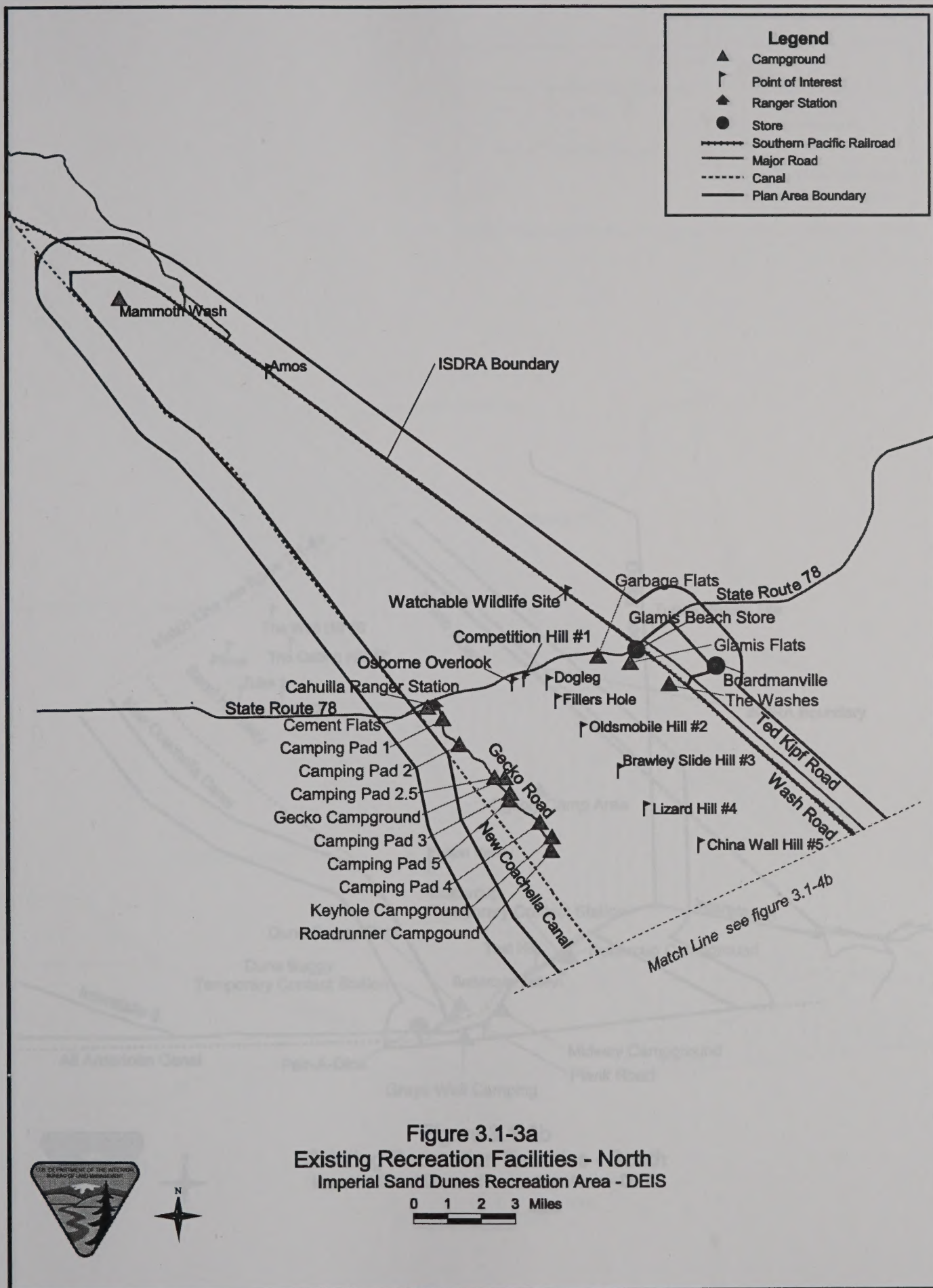








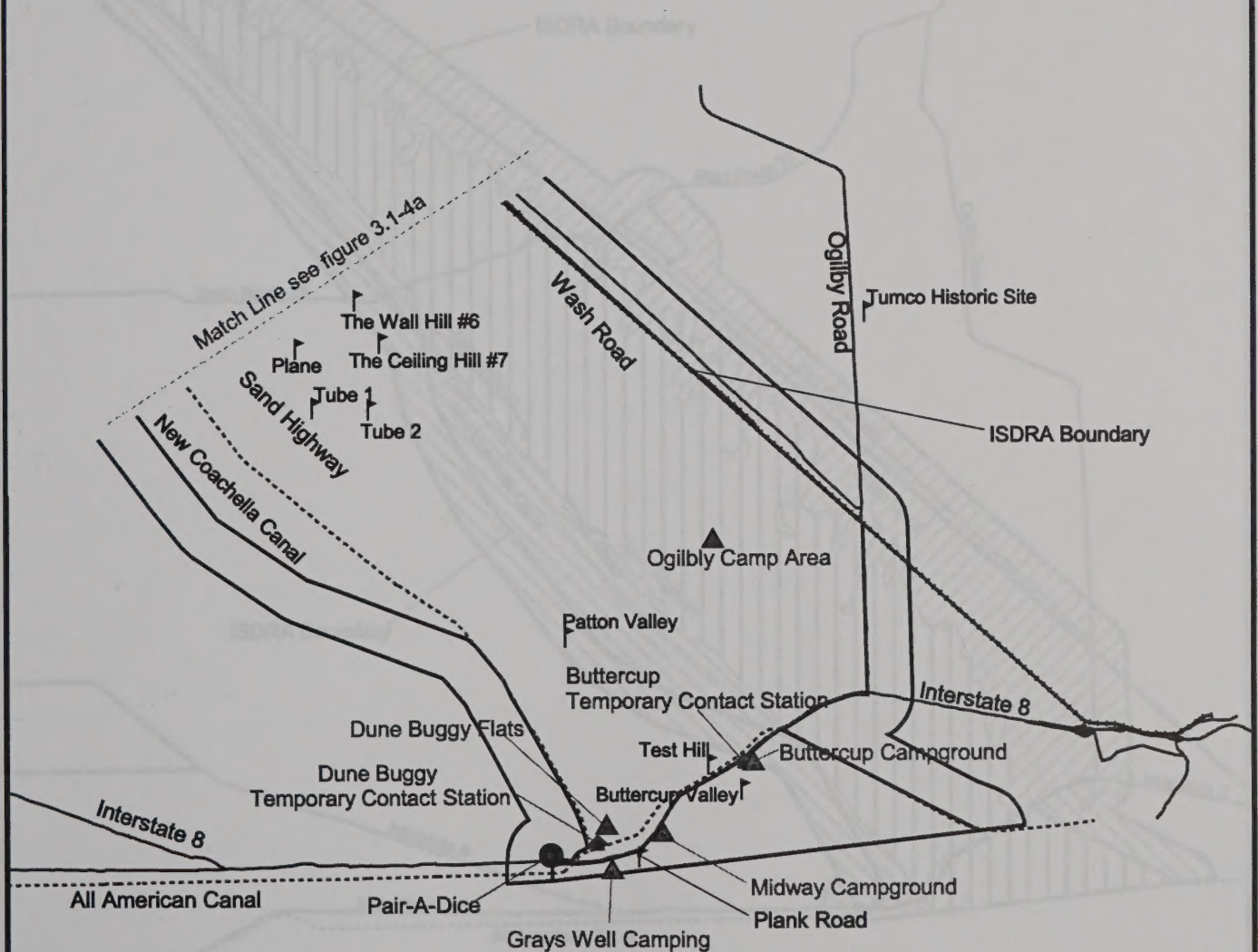
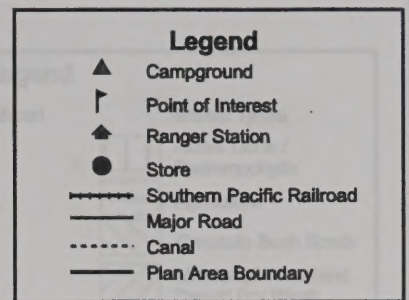












**Figure 3.1-3b**  
**Existing Recreation Facilities - South**  
**Imperial Sand Dunes Recreation Area - DEIS**

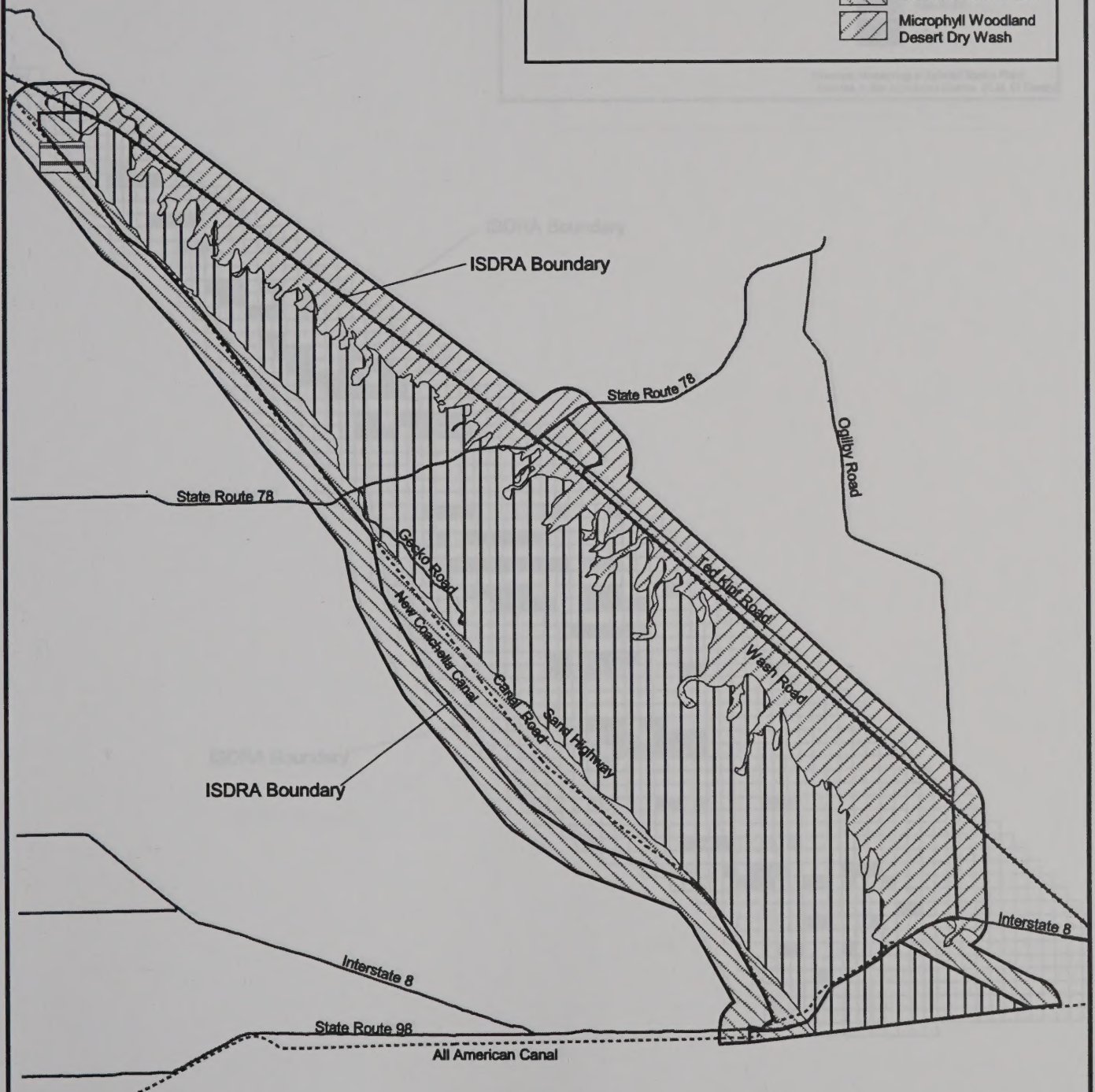
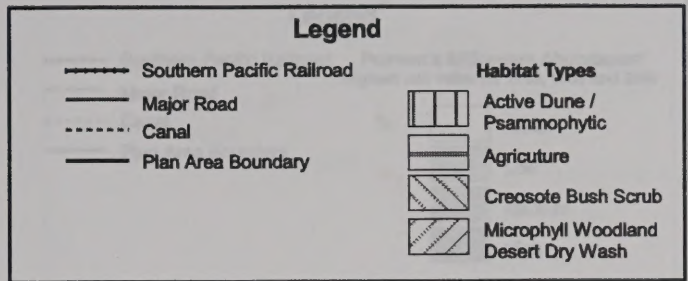
0 1 2 3 Miles











**Figure 3.2-1**  
**Habitat Types**  
 Imperial Sand Dunes Recreation Area - DEIS

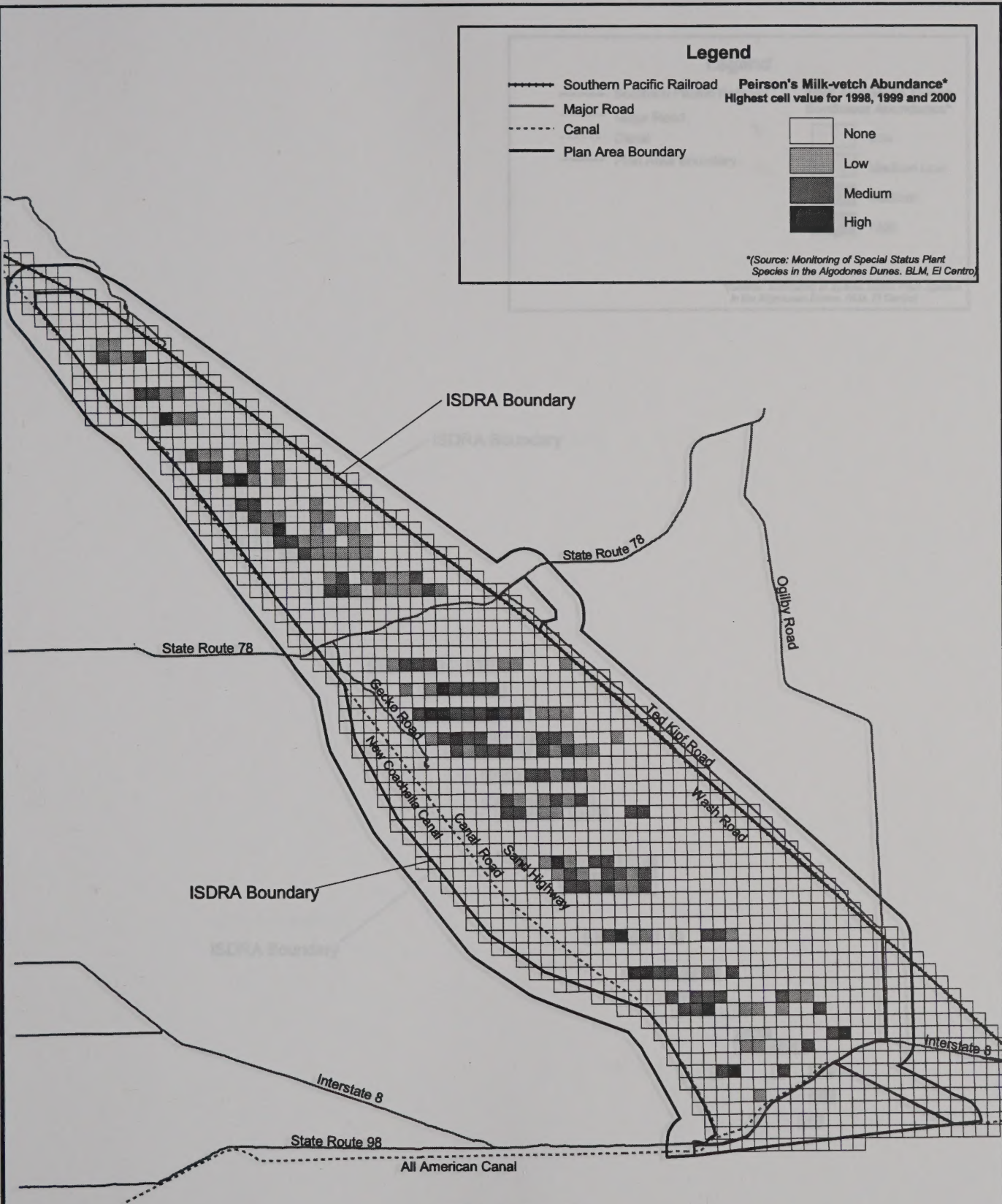
0 2 4 6 Miles











**Figure 3.2-2**  
**Peirson's Milk-vetch Distribution**  
**Imperial Sand Dunes Recreation Area - DEIS**

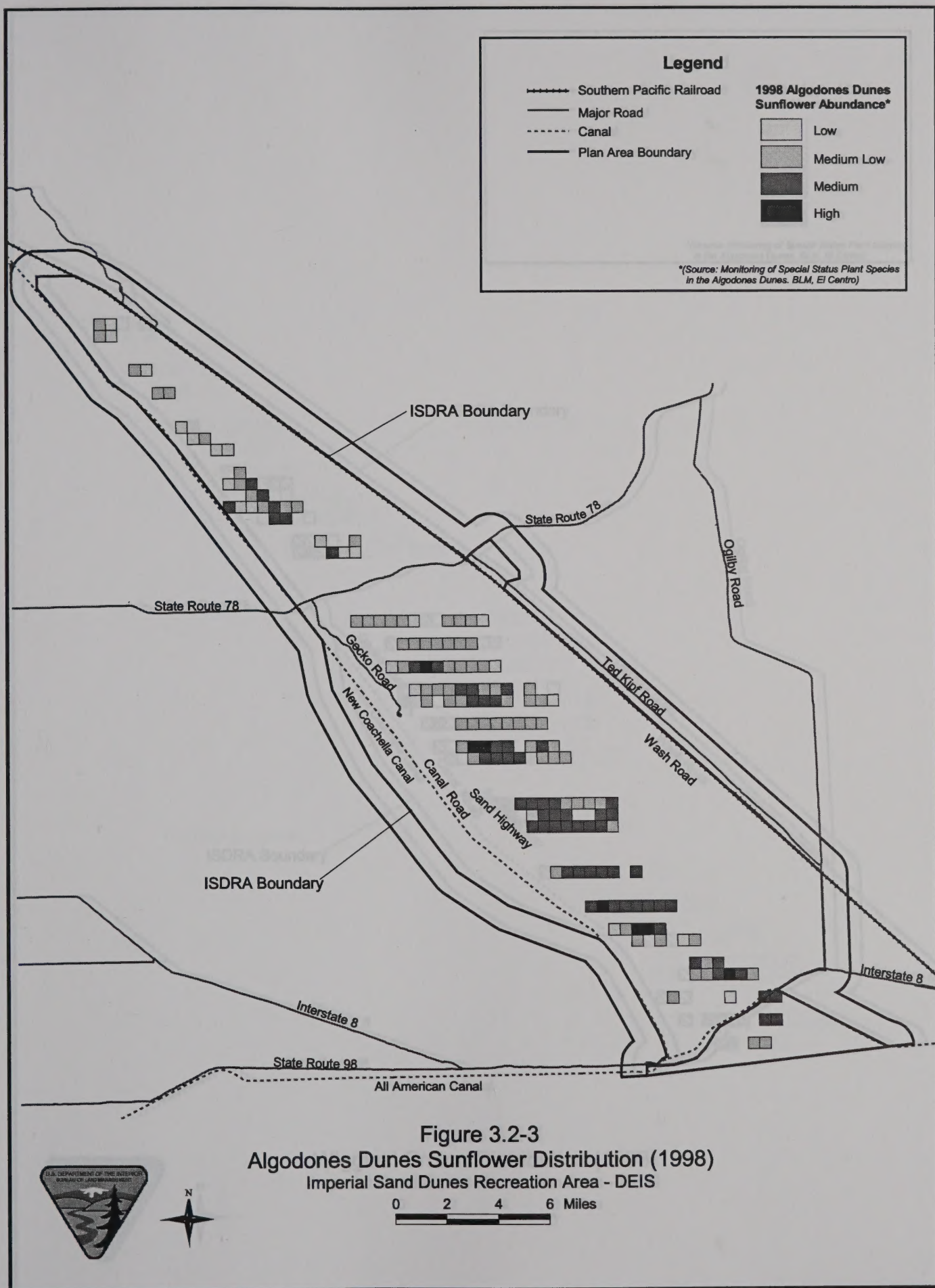


0 2 4 6 Miles





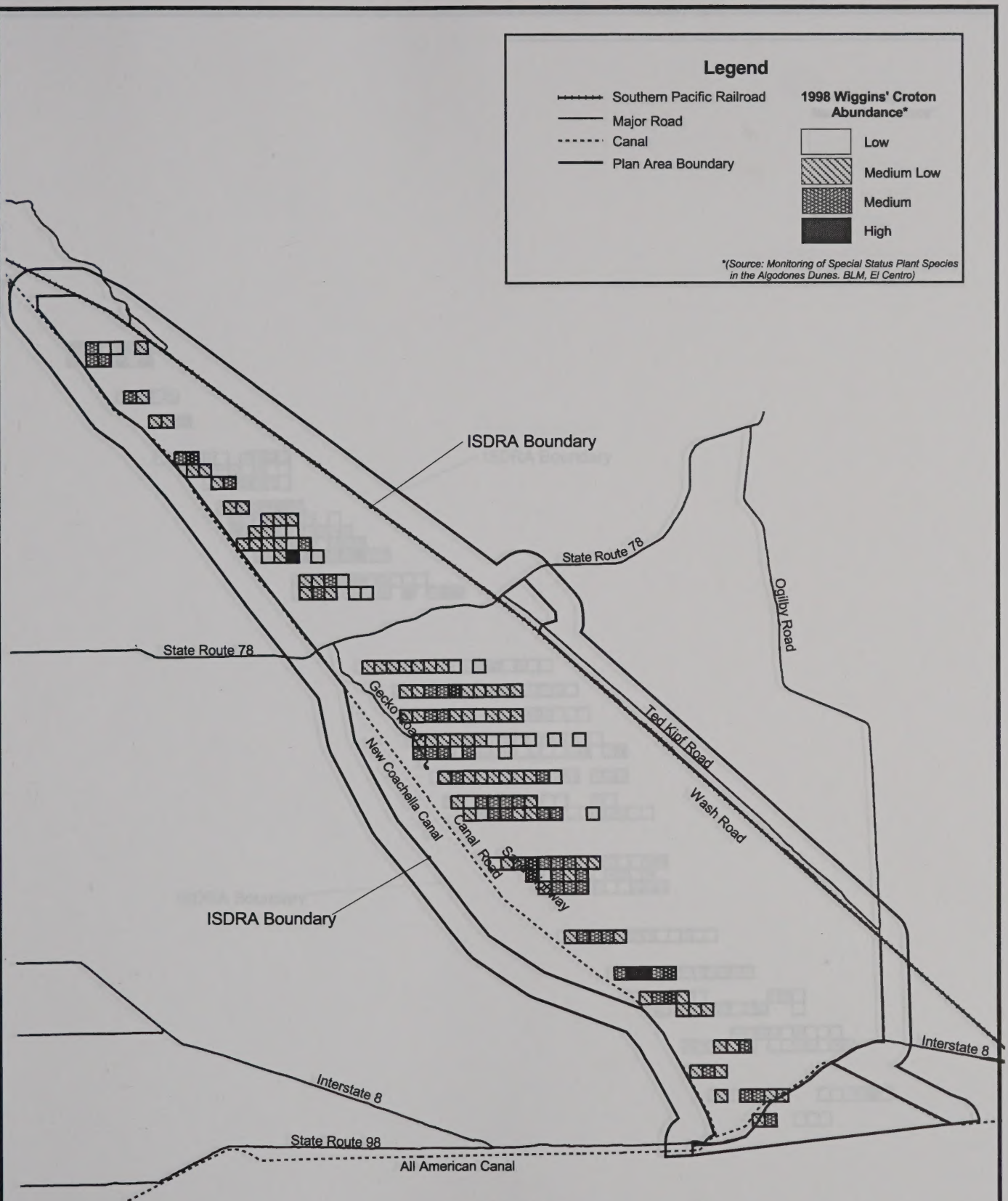












**Figure 3.2-4**  
**Wiggins' Croton Distribution (1998)**  
 Imperial Sand Dunes Recreation Area - DEIS

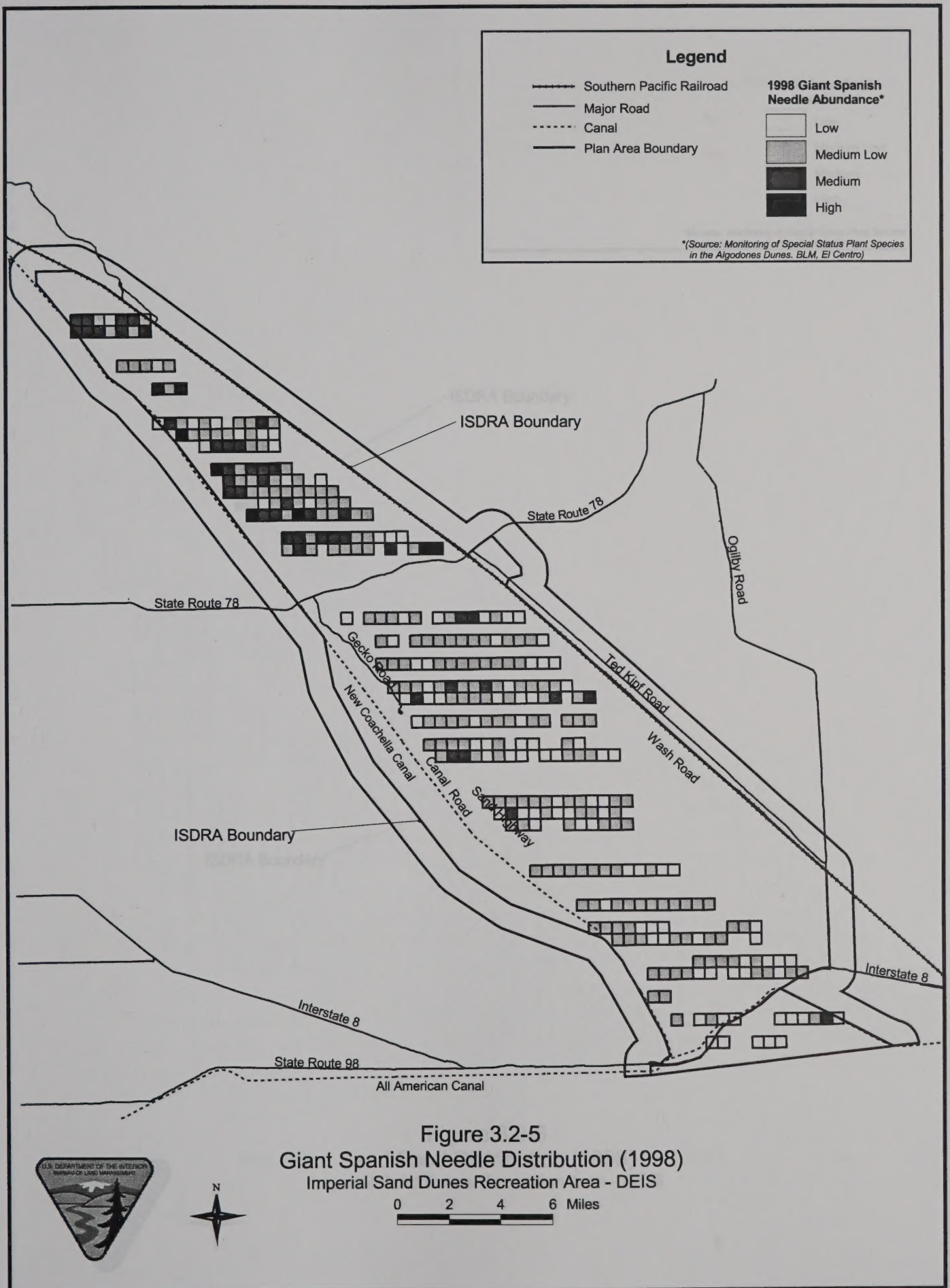
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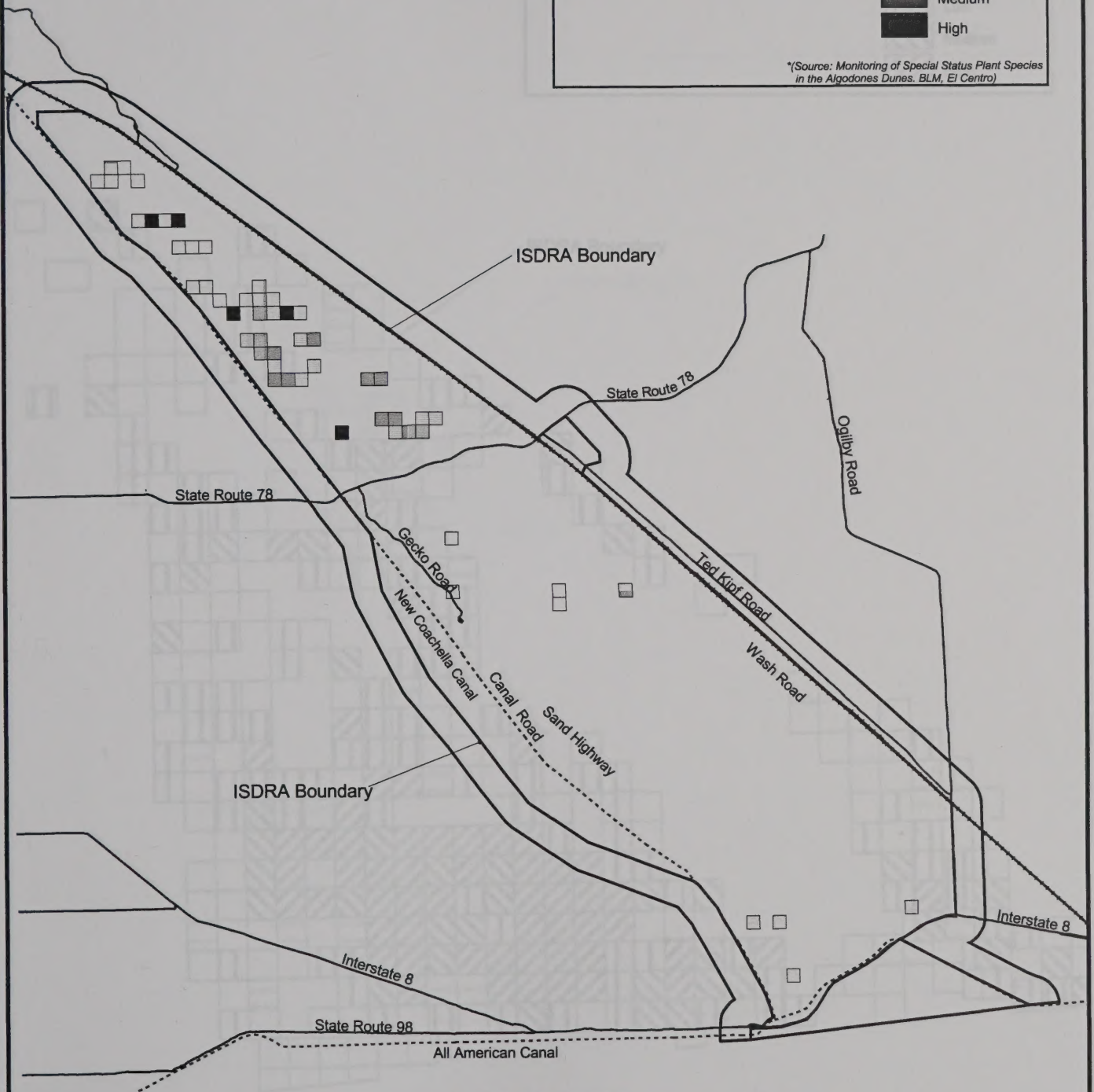
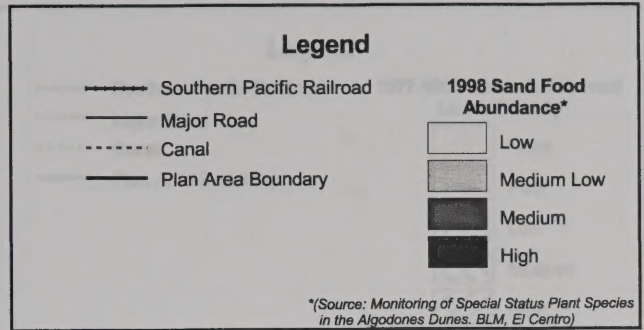












**Figure 3.2-6**  
**Sand Food Distribution (1998)**  
**Imperial Sand Dunes Recreation Area - DEIS**

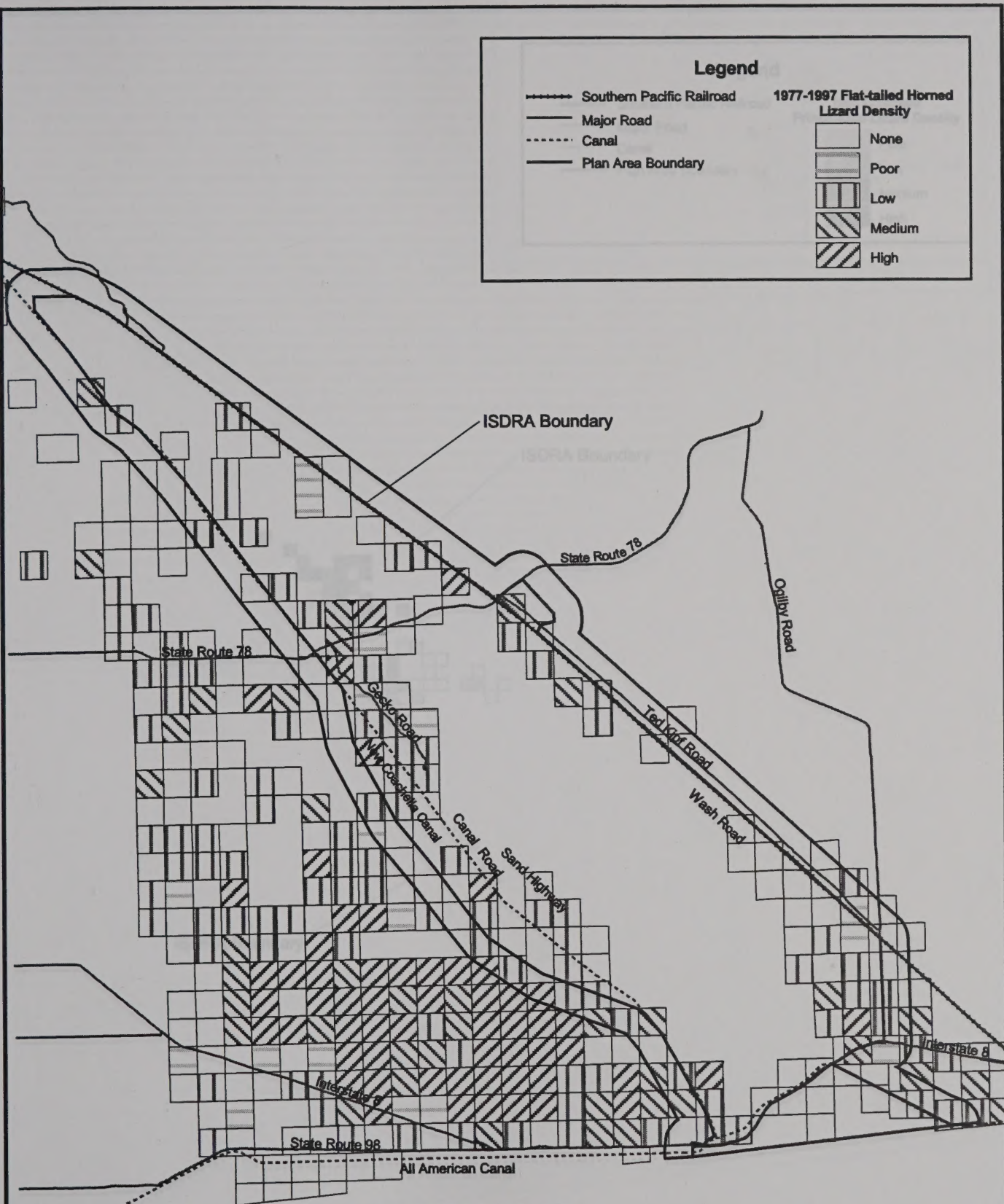
0 2 4 6 Miles











**Figure 3.2-7**  
**Flat-tailed Horned Lizard Distribution (1977-1997)**  
 Imperial Sand Dunes Recreation Area - DEIS

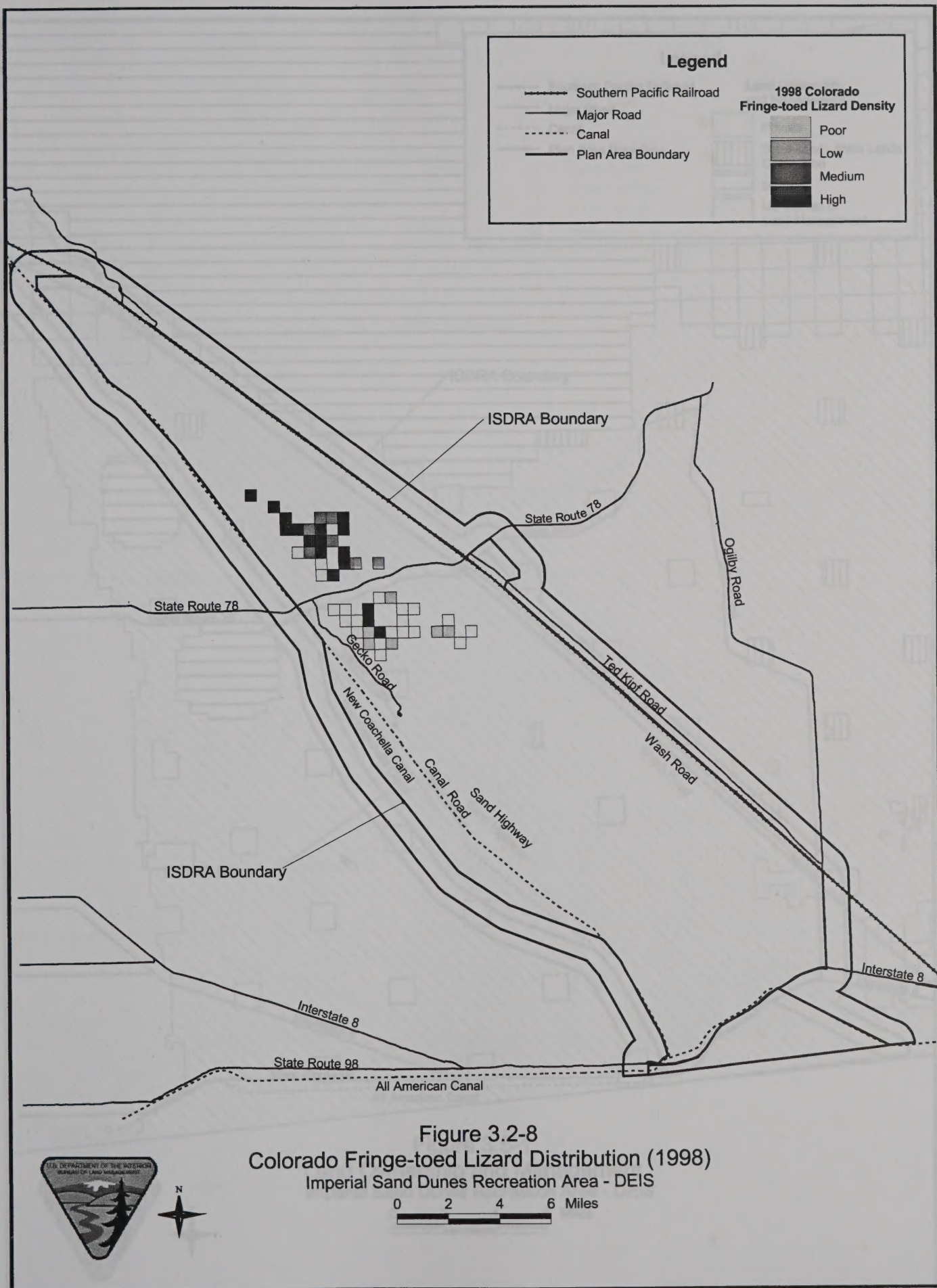


0 2 4 6 Miles





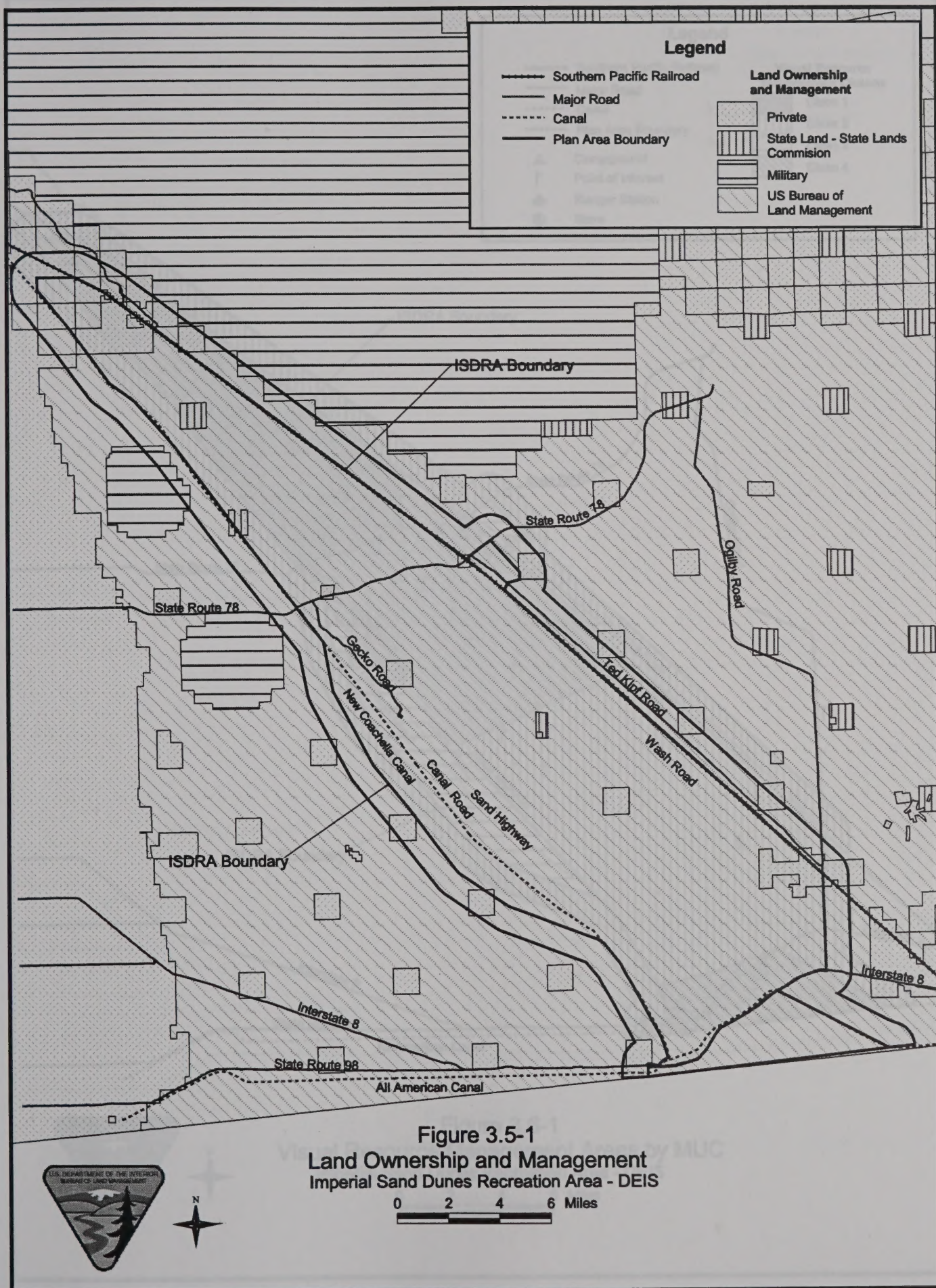








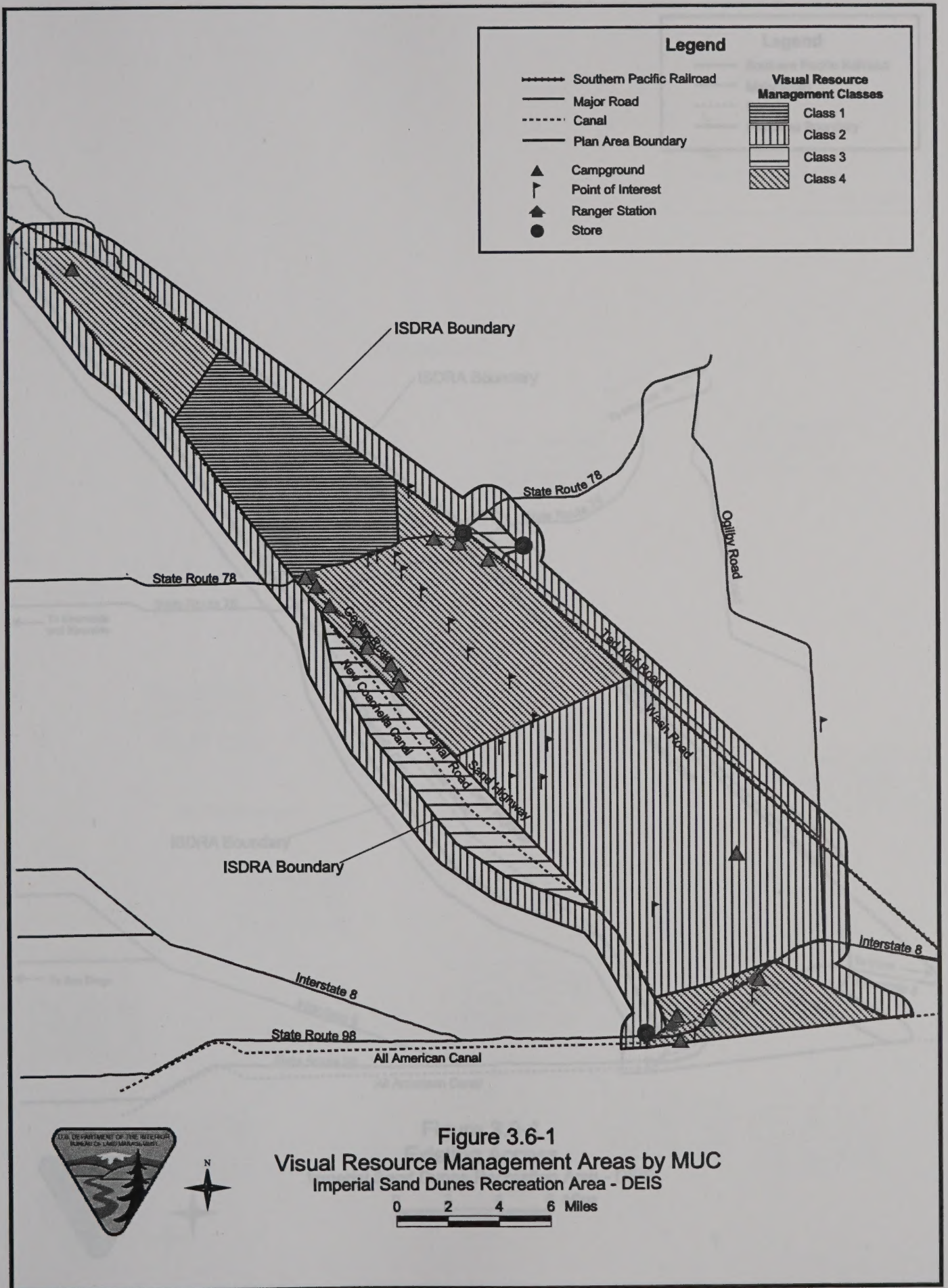








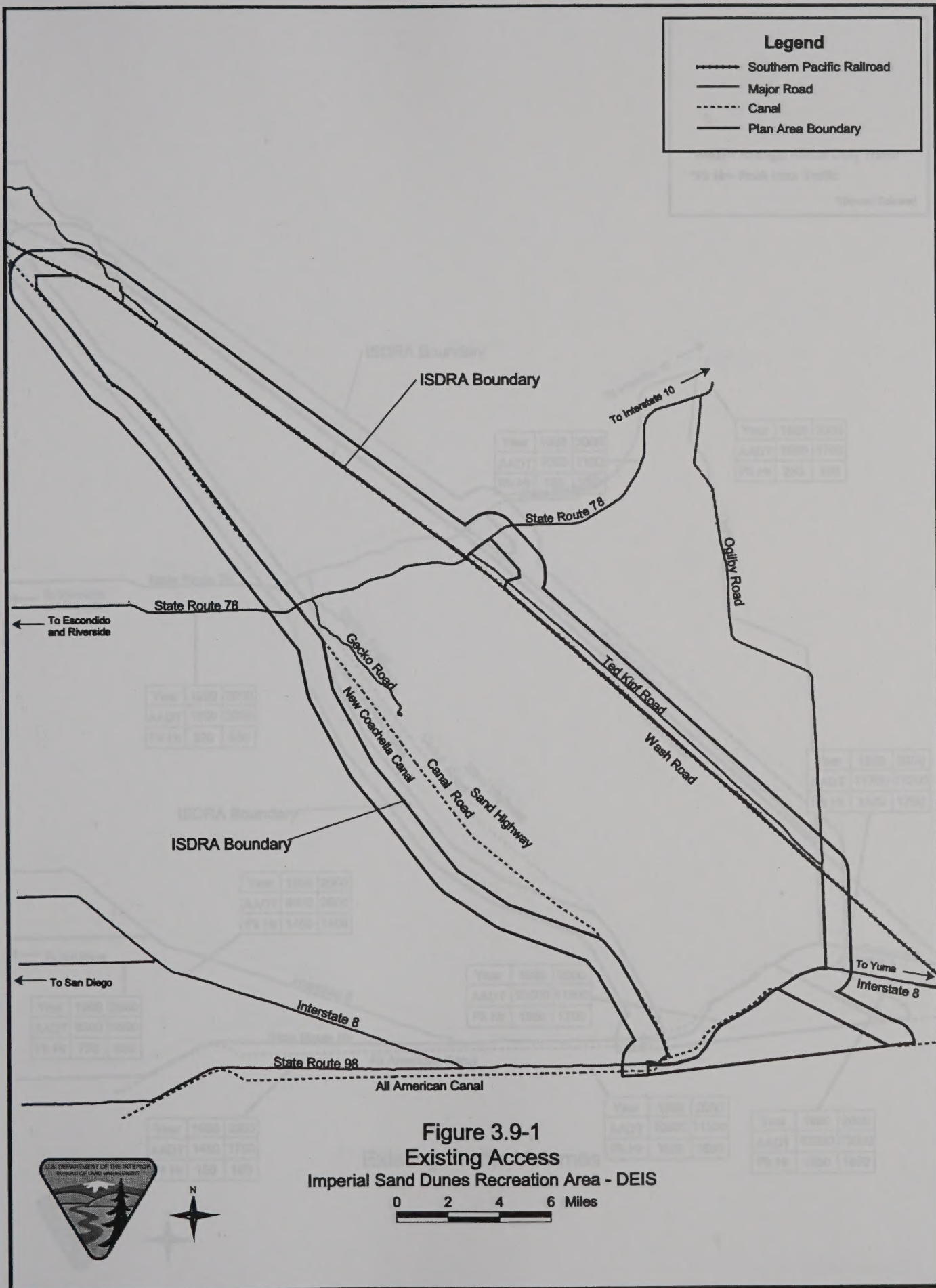








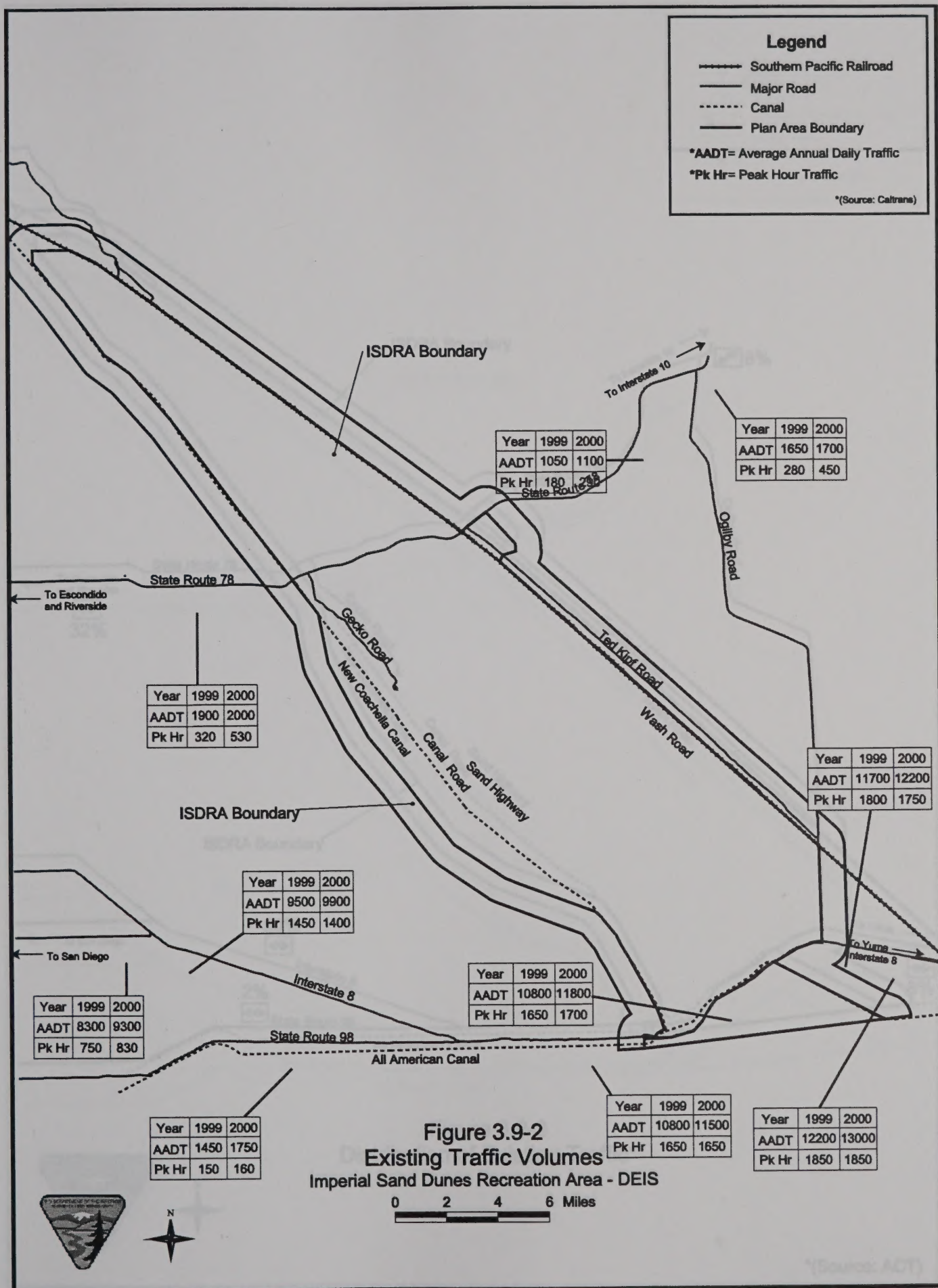








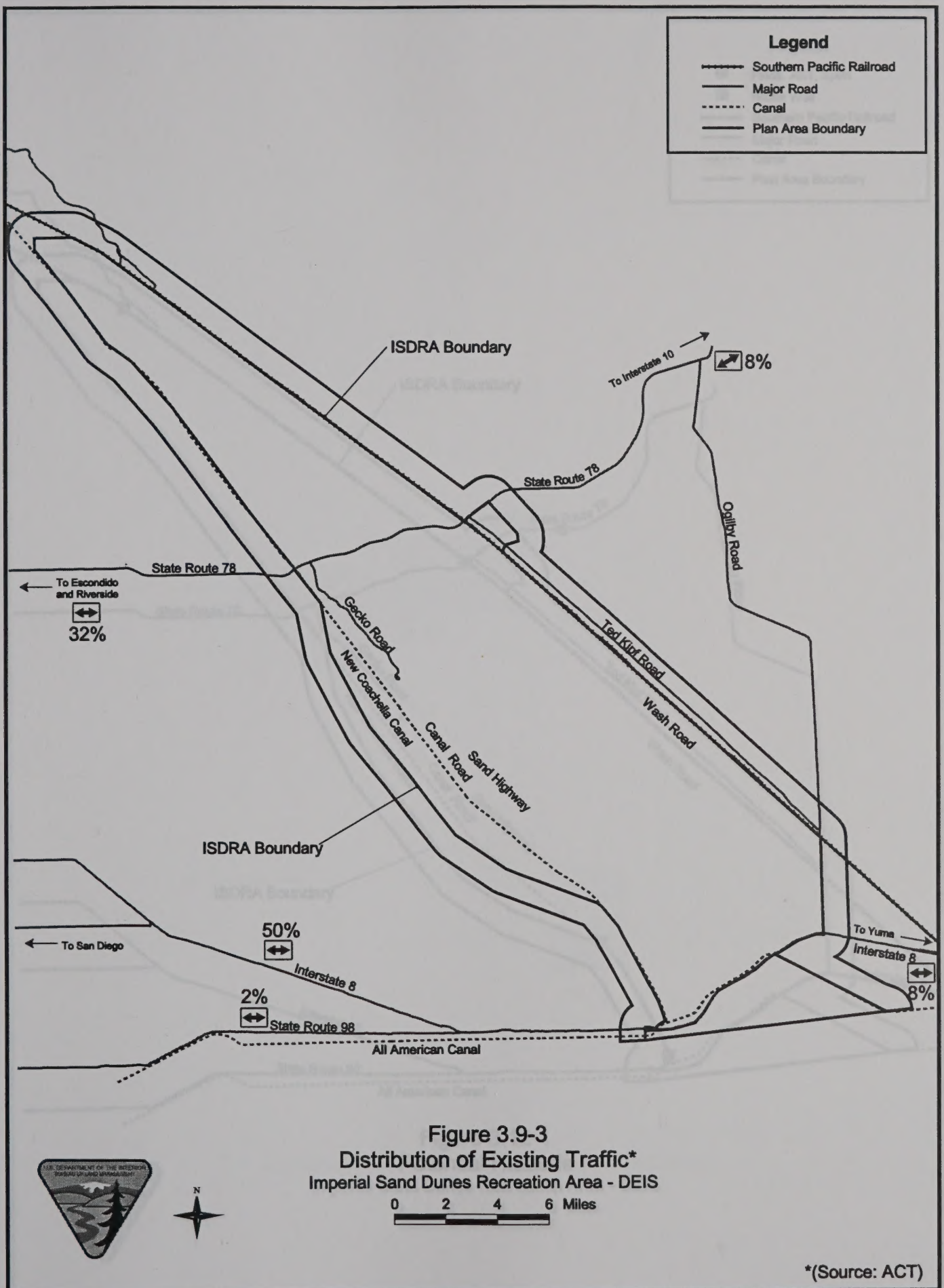


















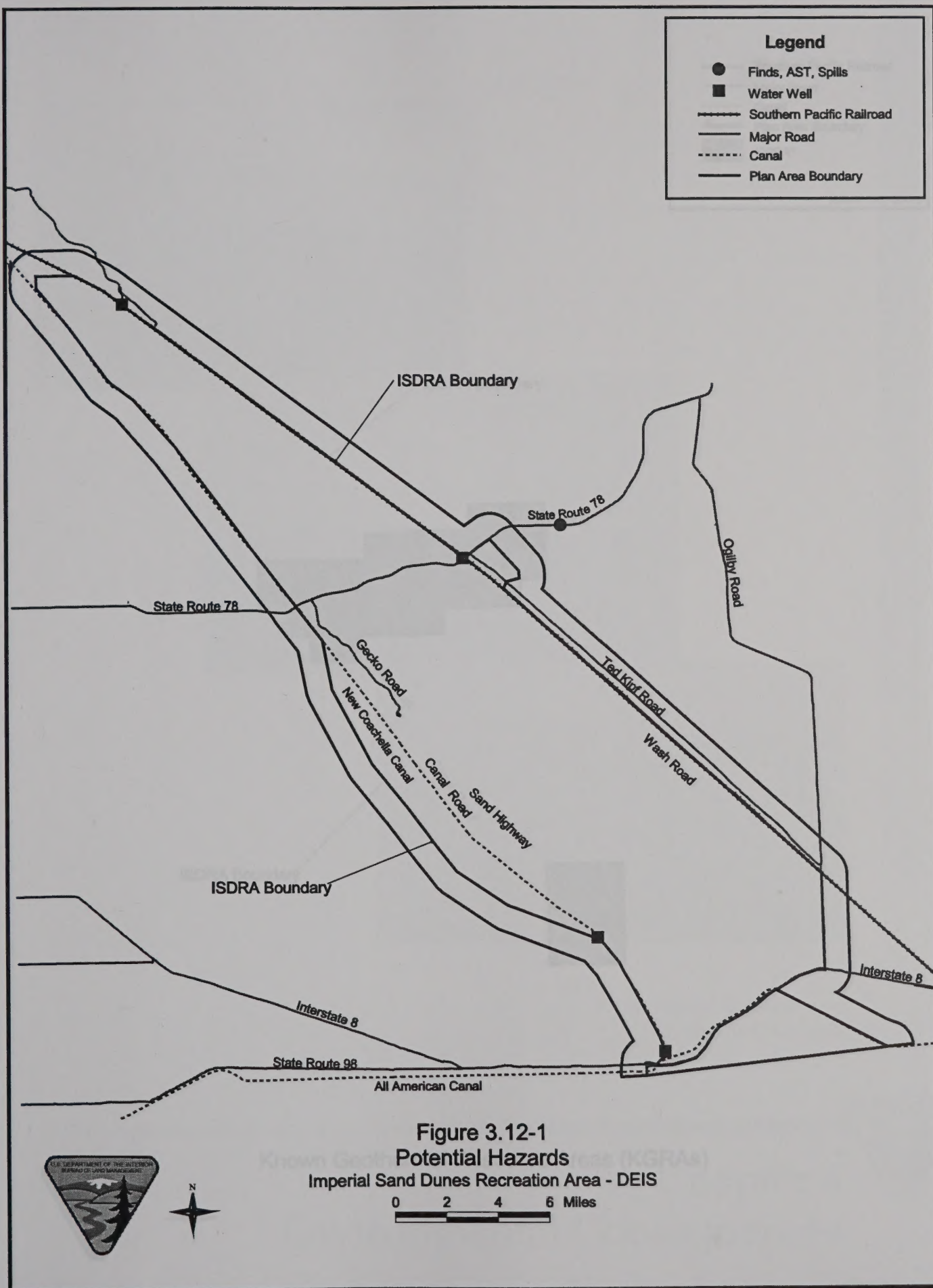
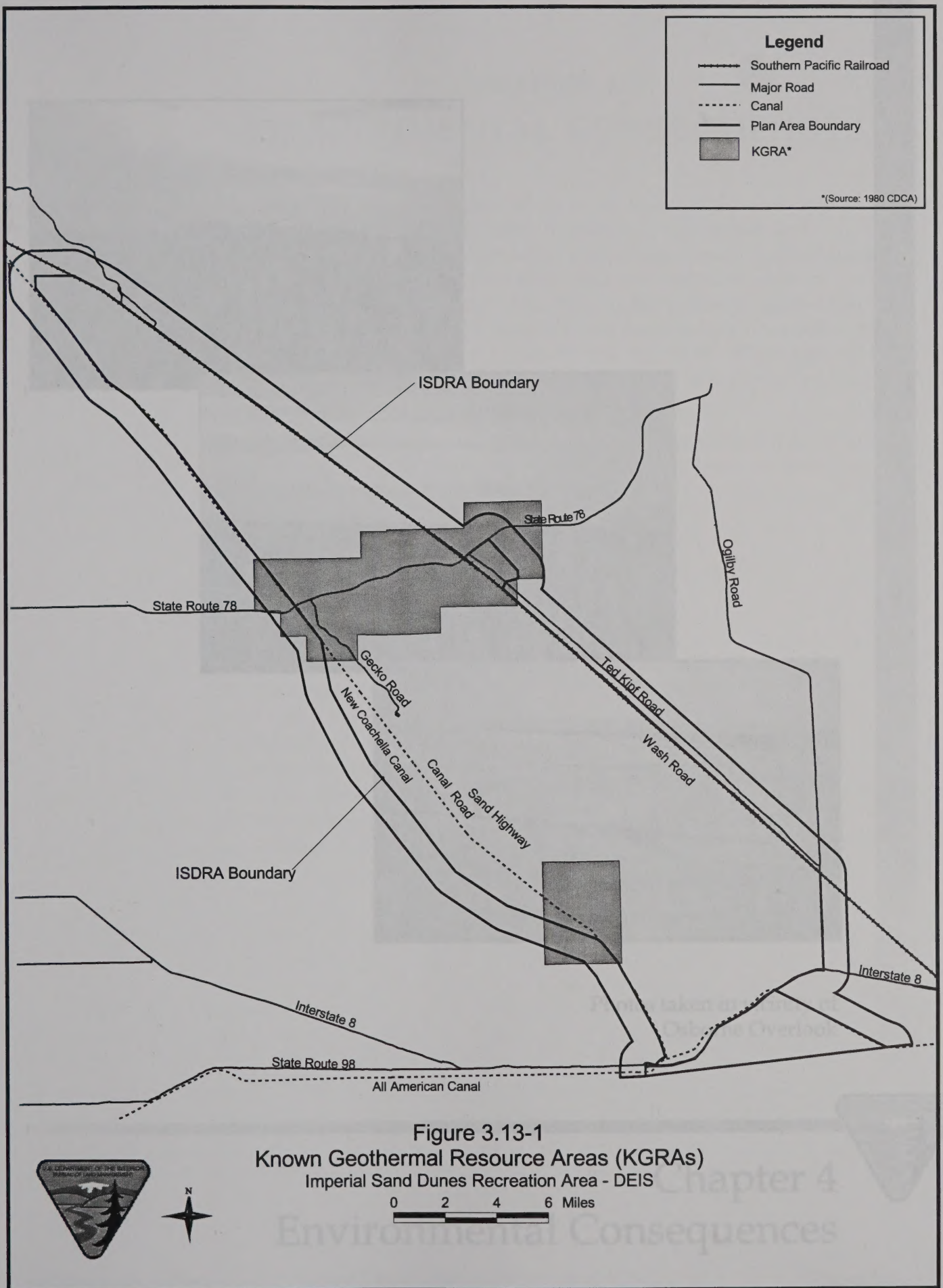


Figure 3.12-1  
Potential Hazards  
Imperial Sand Dunes Recreation Area - DEIS









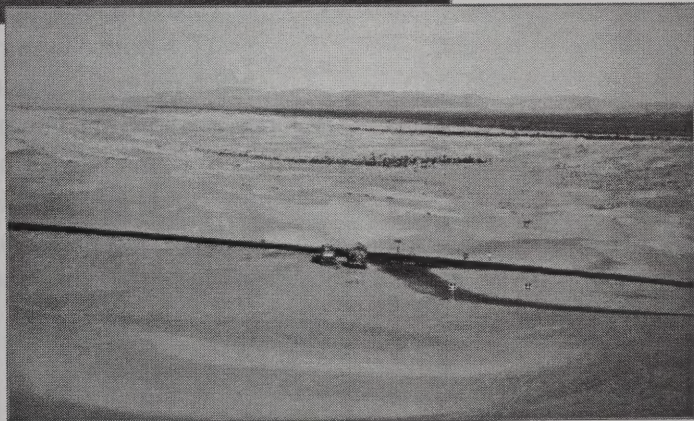






## CHAPTER 4.0

# ENVIRONMENTAL CONSEQUENCES



Photos taken in vicinity of  
Osborne Overlook



## Chapter 4 Environmental Consequences







## CHAPTER 4.0

# ENVIRONMENTAL CONSEQUENCES

The environmental impacts associated with implementation of the project alternatives are described in the following sections. All impacts are considered direct impacts, unless noted as an indirect impact. A direct impact is caused by the action and occurs at the same time and place. Indirect impacts result from one or more of the direct impacts of the action, but may occur later in time or be further removed from the Plan Area. In addition, all impacts are considered adverse unless noted as beneficial. Where applicable, mitigation measures are provided to avoid, reduce, or compensate for project impacts.

The following sections detail the anticipated impacts associated with each of the project alternatives, based on 13 distinct, but interrelated, resource categories. These include:

- Recreation (Section 4.1)
- Biological Resources (Section 4.2)
- Law Enforcement and Public Safety (Section 4.3)
- Socioeconomics (Section 4.4)
- Land Use and Land Ownership (Section 4.5)
- Visual Resources (Section 4.6)
- Water Resources (Section 4.7)
- Cultural Resources (Section 4.8)
- Transportation and Traffic (Section 4.9)
- Noise (Section 4.10)
- Air Quality (Section 4.11)
- Hazardous Materials (Section 4.12)
- Geology, Energy, and Mineral Resources (Section 4.13)



## 4.1 RECREATION RESOURCES

This section assesses impacts to recreational resources as a result of implementing the alternatives described in Chapter 2 of this DEIS.

Alternative 1 (No Action) represents the management actions in the 1987 RAMP. The action alternatives (Alternatives 2, 3, and 4) provide different levels of developed recreation settings and improvements in accordance with designated ROS classes for each alternative (see Chapter 2 and Section 3.1, Recreation, for a discussion of ROS classes) and associated characteristics and uses. The visitor use levels are based on resource capabilities, concerns, and opportunities raised by the public, and varying degrees of response to seasonal shortages of such facilities in the area around the ISDRA. The amount, type, and location of facilities, trails, and roads vary for each action alternative in accordance with the ROS.

### 4.1.1 Assumptions and Assessment Guidelines

The management actions that would occur under all action alternatives (e.g., new and improved facilities, improved public safety measures, and public information encouraging off-peak visits) are expected to improve the overall quality of experience at ISDRA. Adverse impacts on the recreation resources of the ISDRA would result if the following conditions exist:

- The mix of activities changes in such a way as to create incompatibility among recreation uses
- The potential to exceed the visitor supply of the management areas

The estimated range of future visits to the ISDRA for the implementation period of the proposed revised RAMP (i.e., approximately 10 years) under each alternative is provided in Table 4.1-1. These estimates are based upon visitor use data from the 1999/2000 season (see Table 3.1-1). As noted in Section 3.1, the 1999/2000 season represents the baseline condition for visitor attendance because it is consistent with the management of ISDRA under the 1987 RAMP (i.e., prior to implementation of the temporary closures).

Since 1985, the number of visits at the ISDRA has approximately tripled (BLM, 2001q). (A "visit" is defined in the footnotes of Table 4.1-1.) This increase in visitor use represents an annual growth rate of approximately 7.5 percent since 1985. In comparison, the State of California Department of Parks and Recreation has estimated growth in statewide OHV activity of approximately 3.5 percent annually (California Department of Parks and Recreation, 1997). These two percentages comprise the high and low ends of the range of projected increases in visitation at ISDRA under the No Action Alternative (Alternative 1), as shown in Table 4.1-1.

Under the action alternatives (2, 3, and 4), law enforcement is proposed to be increased from the No Action condition for the six major holiday weekends. This management action is expected to result in a decrease in visitation by users who engage in unlawful activity. This initial decrease in visitor use, however, would be offset by other management actions intended to improve



the overall quality of experience at ISDRA (e.g., new and improved facilities, improved public safety measures, public information encouraging off-peak visits, etc.), that are expected to attract visitors seeking OHV recreational experiences consistent with legal activities. For the purposes of analysis in this DEIS, the lower end of the projected visitor-use growth range under the action alternatives is assumed to be similar to the statewide average (i.e., 3.5 percent). For each of the action alternatives (Alternatives 2, 3, and 4), the high end of the projected visitor-use growth range limit would be comparable to the historical growth rate experienced since 1985; but the actual increase in visitor use would be constrained by the availability of camping facilities and management actions designed to maintain a recreation experience associated with a specific ROS class.

The high end of the growth range under Alternative 2 is assumed to be 5 percent (i.e., the approximate mid-point of the 7.5 percent growth rate experienced annually at ISDRA since 1985 and the state projection for growth in OHV use of 3.5 percent).

Under Alternative 3, revising the ROS classification of the Adaptive Management Area is expected to limit the growth of OHV-related visitor use because the change in classification would exclude motorized vehicle use. The upper growth limit under Alternative 3 is, therefore, assumed to average 4 percent annually.

Alternative 4 is expected to result in a higher growth in visitation than the other action alternatives because the change in ROS class under that alternative would allow for additional campgrounds in the Glamis Management Area. On this basis, the anticipated high end of the growth range under Alternative 4 is assumed to average 6 percent annually.

**Table 4.1-1 Visitor Use Projections (2002-2003 to 2012-2013)**

	BASELINE VISITS (1999-2000 SEASON)	ESTIMATED VISITS <sup>1</sup> (2002-2003 SEASON) <sup>2</sup>	PROJECTED VISITS (2012-2013 SEASON) <sup>3</sup>	
			LOW RANGE	HIGH RANGE
Alternative 1	867,753	1,005,000	1,418,000	2,071,000
Alternative 2	867,753	1,005,000	1,418,000	1,637,000
Alternative 3	867,753	1,005,000	1,418,000	1,488,000
Alternative 4	867,753	1,005,000	1,418,000	1,800,000

<sup>1</sup>A "visit" occurs when one person visits BLM lands to engage in any recreation activity, whether for a few minutes, full day, or more.

<sup>2</sup>The estimate for the 2002-2003 season is based on an average 5 percent growth rate from the baseline season (1999-2000).

<sup>3</sup>This projection is the expected change in visitation between the 2002-2003 season and the 2012-2013 season. This represents the first season following implementation of a revised RAMP and 10 years later (i.e., the proposed period of implementation for a revised RAMP).



### 4.1.2 Impacts

For this analysis of recreational resources, the assessment focuses on the ROS classifications as they pertain to the action alternatives. The proposed ROS classifications for the action alternatives (Alternatives 2, 3, and 4) are described in Chapter 2 (see Table 2-2). For Alternative 1, the BLM has not assigned any ROS classifications because a ROS inventory of the lands within the ISDRA has not yet been conducted. The discussion of each action alternative focuses on the following:

- The change in ROS designation, when compared to the baseline condition
- The expected increase in visitation and the visitor supply of the nine management areas

For Alternative 1, the assessment focuses on continued implementation of the 1987 RAMP and baseline conditions (excluding the interim closures).

#### 4.1.2.1 Alternative 1

This alternative would not affect the current status of the North Algodones Dunes Wilderness Area, which prohibits motorized use within its boundaries, but allows nonmotorized recreation use. Alternative 1 is depicted in Figure 2-1 in this DEIS.

Although recreationists would continue to congregate at high-use areas under Alternative 1, it is likely that there would be some change to existing visitor use patterns (i.e., the spatial distribution of recreation visits at ISDRA). As noted above in Table 4.1-1, annual visitation in 2002-2003 is expected to be approximately 1,005,000; by 2012-2013 annual visitation would grow to an estimated 1,418,000 to 2,071,000. This increase in visitation is likely to result in a dispersal of recreationists into less crowded areas, thereby increasing the concentration of visitors in areas that currently maintain a lower number of visitors. As a result, compatibility issues may arise between those users seeking a more solitary experience and those users dispersed into lower-use areas due to overcrowding. This is considered a potentially adverse impact of Alternative 1.

Increased visitation would present various management challenges for ISDRA staff, including those involving public safety. This issue is addressed further in Section 4.3 (Law Enforcement and Public Safety).

Implementation of this alternative would also provide for some recreation improvements, as outlined in the 1987 RAMP. These improvements include installation of signs; development and distribution of brochures; presentation of evening programs in the Gecko, Glamis, or Buttercup areas; development of a vehicle corridor along the Old Coachella Canal; development of a hiker/equestrian trailhead along the Niland-Glamis Road north of Glamis; establishment of Osborne Lookout as an interpretive site (and eventually to a day-use facility); various improvements at the camping areas; improvements to the Cahuilla Ranger Station; and provisions for increasing visitor and staff safety at ISDRA. These improvements would provide a beneficial impact to the recreationists who visit those areas.



#### 4.1.2.2 Alternative 2

#### ROS Designations

Implementation of Alternative 2 would result in the designation of individual ROS categories to each of the nine management areas in the Plan Area, as described previously in Chapter 2. The specific ROS designations associated with this alternative are depicted in Figure 4.1-1. Table 4.1-2 provides a breakdown of the acreage and a description of the type of recreation experience that characterizes each ROS class designation.

**Table 4.1-2 ROS Class Acreage and Description  
Alternative 2**

ROS CLASS	DESCRIPTION	DESIGNATED ACREAGE
Rural	Indicates that the area is characterized by a natural environment that has been modified substantially by development of structures, vegetative manipulation, or pastoral agricultural development. Resource modification and utilization practices may be used to enhance specific recreational activities and maintain vegetative cover and soil. Sights and sounds of humans are readily evident, and the interaction among users is often moderate to high. Many facilities are designed for use by a large number of people, and facilities often are provided for special activities. Moderate user densities are present away from developed sites. Facilities for intensified motorized use and parking are available.	29,741
Roaded Natural	Indicates that the area is characterized by a predominantly natural-appearing environment with moderate evidence of the sights and sounds of humans. Such evidence usually harmonizes with the natural environment. Interaction among users may be moderate to high, with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is allowed and incorporated into construction standards and design of facilities.	64,389
Semi-Primitive Motorized	Indicates that the area is characterized by a predominantly natural or natural-appearing environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. The area is managed in such a way that there are minimum onsite controls, and restricted use of local primitive or collector roads with predominantly natural surfaces and trails suitable for motorbikes is permitted.	105,208
Semi-Primitive Non-Motorized	Indicates that the area is characterized by a predominantly natural or natural-appearing environment of moderate to large size. Interaction among users is low, but there is often evidence of other users. The area is managed in such a way that minimum onsite controls; and restrictions may be present, but would be subtle. Motorized recreation use is not permitted, but local roads used for other resource management activities may be present on a limited basis.	27,695
Total		227,033

Under Alternative 2, management actions would be applied to ensure that the recreation experience at ISDRA was consistent with the ROS class designated to each of the nine management areas. In contrast, visitation under the baseline condition would continue to grow unmanaged, such that the possibility of conflicts among competing recreation uses would result. For example, under baseline conditions, opportunities for lower intensity



recreational activity (e.g., as characterized by the semi-primitive motorized and roaded natural ROS classes) would eventually be diminished due to overcrowding.

Management actions to be applied under Alternative 2 in support of the ROS designations include facility development and actions to ensure that the visitor supply (discussed below) at ISDRA is not substantially exceeded. The anticipated result is the conservation of unique recreation opportunities afforded by ISDRA, such as those associated with the Semi-Primitive Motorized and Roaded Natural ROS classes. This is considered a beneficial impact.

### Visitor Supply

The estimated visitor supply at ISDRA is provided in Table 4.1-3. The visitor supply is defined as the maximum number of visitors that could occur at ISDRA while maintaining the designated ROS class.

**Table 4.1-3 Visitor Supply by Management Area**

AREA	DESIGNATED ROS CLASS	VISITOR SUPPLY <sup>a</sup>
Gecko Management Area	Rural	3,172
Buttercup Management Area	Rural	16,569
Mammoth Management Area	Semi-Primitive Motorized	1,890
Glamis Management Area	Roaded Natural	12,684
Adaptive Management Area <sup>b</sup>	Semi-Primitive Motorized	525
Ogilby Management Area	Roaded Natural	9,702
Dune Buggy Flats Management Area	Roaded Natural	11,340
North Algodones Dunes Management Area	Semi-Primitive Non-Motorized	116 <sup>c</sup>
Total	NA	55,998

<sup>a</sup>The visitor supply presented is based on the acreage available for camping, the number of available campsites, an average number of vehicles per camping party, and an average number of people per vehicle.

<sup>b</sup>The Adaptive Management Area has a supply of 75 groups of OHVs at one time. An OHV group consists of 7 vehicles.

<sup>c</sup>No motorized vehicles allowed at these campsites.

Historically, visitation during major holiday weekends has often exceeded 100,000 visits (BLM, 2001q). This level of visitation far exceeds the visitor supply at ISDRA, as defined above in Table 4.1-3. However, over the course of the recreation season at ISDRA (October 1 through May 31), the total annualized visitor supply is expected to be adequate. For example, assuming that all visits occur on weekends only, the total number of visits that could occur at ISDRA over the entire season while still maintaining the designated ROS classes would be over 2.1 million (39 weekends x 55,998 visits supply). Because the high estimate of future visits under this alternative (see



Table 4.1-1) is just over 1.6 million, the total annual visitor supply would be sufficient to meet the demand over the course of a full season. Therefore, overall access at ISDRA would be maintained.

While management actions can be expected to redistribute visits to weekends other than the major holiday weekends, this does not represent an adverse impact to recreation resources because it would not alter the recreation experience at ISDRA. As noted above, the maintenance of designated ROS classifications through management actions would provide a beneficial impact to recreation by preserving the unique quality of experience provided at ISDRA (e.g., Semi-Primitive Motorized and Roaded Natural ROS classes).

### **Other Management Actions**

This alternative would include updating the kiosks at the Wildlife Viewing Area. This would provide a beneficial impact to the public.

Osborne Overlook would be closed to camping with implementation of this alternative. This would eliminate a recreational opportunity that is offered by the baseline condition.

Applying a dust palliative on the Wash Road has the potential to reduce the dust and, therefore, improve the quality of the recreational experience in that area.

This alternative would provide for the development of pit toilet facilities in Glamis Flats, The Washes, and Dune Buggy Flats areas. This would provide an amenity to recreationists and is considered a beneficial impact.

Closing Oldsmobile Hill, Competition Hill, Competition Hill South Dunes, Test Hill, and Patton Valley at night would eliminate a recreational opportunity that is offered in the baseline condition.

In the Buttercup Management Area, interpretive facilities and parking would be developed near Grays Well Road and a law enforcement/ranger station facility would be constructed. These facilities would provide an amenity to recreationists, and would provide a beneficial impact.

#### **4.1.2.3**

#### **Alternative 3**

### **ROS Designations**

Implementation of Alternative 3 would result in the designation of individual ROS categories to each of the nine management areas in the Plan Area, as described previously in Chapter 2. The specific ROS designations associated with this alternative are depicted in Figure 4.1-2. Table 4.1-4 provides a breakdown of the acreage and a description of the type of recreation experience that characterizes each ROS class designation.



**Table 4.1-4 ROS Class Acreage and Description**  
**Alternative 3**

ROS CLASS	DESCRIPTION	DESIGNATED ACREAGE
Roaded Natural	Indicates that the area is characterized by a predominantly natural-appearing environment with moderate evidence of the sights and sounds of humans. Such evidence usually harmonizes with the natural environment. Interaction among users may be moderate to high, with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is allowed and incorporated into construction standards and design of facilities.	29,741
Semi-Primitive Motorized	Indicates that the area is characterized by a predominantly natural or natural-appearing environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. The area is managed in such a way that there are minimum onsite controls, and restricted use of local primitive or collector roads with predominantly natural surfaces and trails suitable for motorbikes is permitted.	64,395
Semi-Primitive Non-Motorized	Indicates that the area is characterized by a predominantly natural or natural-appearing environment of moderate to large size. Interaction among users is low, but there is often evidence of other users. The area is managed in such a way that minimum onsite controls and restrictions may be present, but would be subtle. Motorized recreation use is not permitted, but local roads used for other resource management activities may be present on a limited basis.	132,897
Total		227,033

Under Alternative 3, management actions would be applied to ensure that the recreation experience at ISDRA was consistent with the ROS class designated to each of the nine management areas. In contrast, visitation under the baseline condition would continue to grow unmanaged, such that the possibility of conflicts among competing recreation uses would result. For example, under baseline conditions, opportunities for lower intensity recreational activity (e.g., as characterized by the semi-primitive motorized and roaded natural ROS classes) would eventually be diminished due to overcrowding. Compared to Alternative 2, Alternative 3 would provide an increased area available for semi-primitive recreation experiences, including semi-primitive non-motorized, which would constitute more than half of the ISDRA under this alternative.

Management actions to be applied under Alternative 2 in support of the ROS designations include facility development and actions to ensure that the visitor supply (discussed below) at ISDRA is not substantially exceeded. The anticipated result is the conservation of unique recreation opportunities afforded by ISDRA, such as those associated with the Semi-Primitive Motorized and Roaded Natural ROS classes. This is considered a beneficial impact. Potential impacts relating to the decrease in acreage available for motorized vehicle activity are discussed below under visitor supply.



### Visitor Supply

The estimated visitor supply at ISDRA under this alternative would be lower than that available under Alternative 2. This is due to the increased acreage designated as Semi-Primitive and Rural ROS classes, which are associated with a less intense (i.e., a lower concentration) of visitors.

Historically, visitation during major holiday weekends has often exceeded 100,000 visits (BLM, 2001q). Because the total area available for OHV use under Alternative 3 would be less than half of that available under Alternative 2, the visitor supply is anticipated to be reduced proportionately. Assuming that the visitor supply under Alternative 3 is approximately 50 percent of that available under Alternative 2, the visitor supply would be exceeded on major holiday weekends. Further, the annual visitor supply over the course of the ISDRA season would be just over 1 million visits (i.e., 39 weekends x 55,998 visits x 50 percent). Because both the low and high estimates for the number of future visits under Alternative 3 (see Table 4.1-1) would exceed the annual visitor supply, not all recreationists desiring to attend ISDRA could be accommodated. This represents an adverse impact to recreation resources.

The implementation of management actions designed to maintain the Semi-Primitive Non-Motorized ROS class at ISDRA would provide a benefit to recreationists not engaging in motorized vehicle activity. However, non-OHV activities represent the minority of visits to ISDRA, historically averaging around 10 percent of the total (BLM, 1993).

### Other Management Actions

Impacts related to other management actions (e.g., facility development, nighttime closures, etc.) would be similar to those discussed previously under Alternative 2.

#### 4.1.2.4 Alternative 4

### ROS Designations

Implementation of Alternative 4 would result in the designation of individual ROS categories to each of the nine management areas in the Plan Area, as described previously in Chapter 2. The specific ROS designations associated with this alternative are depicted in Figure 4.1-3. Table 4.1-5 provides a breakdown of the acreage and a description of the type of recreation experience that characterizes each ROS class designation.



**Table 4.1-5 ROS Class Acreage and Description**  
**Alternative 4**

<b>ROS CLASS</b>	<b>DESCRIPTION</b>	<b>DESIGNATED ACREAGE</b>
Urban	Indicates that the area is characterized by a substantially urbanized environment, although the background may have natural-appearing elements. Renewable resource modification and utilization practices are often used to enhance specific recreation activities. Vegetative cover is often exotic and manicured, and sights and sounds from humans are predominant onsite. Large numbers of users can be expected both onsite and in nearby areas. Facilities for highly intensified motor use and parking are available with forms of mass transit often available to carry people throughout the site.	29,741
Rural	Indicates that the area is characterized by a natural environment that has been modified substantially by development of structures, vegetative manipulation, or pastoral agricultural development. Resource modification and utilization practices may be used to enhance specific recreational activities and maintain vegetative cover and soil. Sights and sounds of humans are readily evident, and the interaction among users is often moderate to high. Many facilities are designed for use by a large number of people, and facilities often are provided for special activities. Moderate user densities are present away from developed sites. Facilities for intensified motorized use and parking are available.	64,389
Roaded Natural	Indicates that the area is characterized by a predominantly natural-appearing environment with moderate evidence of the sights and sounds of humans. Such evidence usually harmonizes with the natural environment. Interaction among users may be moderate to high, with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is allowed and incorporated into construction standards and design of facilities.	45,990
Semi-Primitive Motorized	Indicates that the area is characterized by a predominantly natural or natural-appearing environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. The area is managed in such a way that there are minimum onsite controls, and restricted use of local primitive or collector roads with predominantly natural surfaces and trails suitable for motorbikes is permitted.	59,218
Semi-Primitive Non-Motorized	Indicates that the area is characterized by a predominantly natural or natural-appearing environment of moderate to large size. Interaction among users is low, but there is often evidence of other users. The area is managed in such a way that minimum onsite controls and restrictions may be present, but would be subtle. Motorized recreation use is not permitted, but local roads used for other resource management activities may be present on a limited basis.	27,695
Total		227,033

Under Alternative 4, management actions would be applied to ensure that the recreation experience at ISDRA is consistent with the ROS class designated to each of the nine management areas. In contrast, visitation under the baseline condition would continue to grow unmanaged, such that the possibility of conflicts among competing recreation uses would result. For example, under baseline conditions, opportunities for lower intensity recreational activity (e.g., as characterized by the Semi-Primitive Motorized and Roaded Natural



ROS classes) would eventually be diminished due to overcrowding. Compared to Alternatives 2 and 3, this alternative would provide an increased area available for Rural and Urban recreation experiences. Relative to Alternative 2 and 3, Alternative 4 would provide less acreage designated to Semi-Primitive Motorized recreational activity.

Management actions to be applied under Alternative 4 in support of the ROS designations include facility development and actions to ensure that the visitor supply (discussed below) at ISDRA is not substantially exceeded. The anticipated result is the conservation of recreation opportunities characterized by the Rural, Roaded Natural, and Semi-Primitive Motorized ROS classes. This is considered a beneficial impact.

### **Visitor Supply**

The estimated visitor supply at ISDRA under this alternative would be greater than that available under Alternatives 2 and 3. This is due to the increased acreage designated for OHV use (i.e., Urban, Rural, Roaded Natural, and Semi-Primitive Motorized ROS classes) as well as the higher concentration of activity that could be accommodated.

Historically, visitation during major holiday weekends has often exceeded 100,000 visits (BLM, 2001q). While the total area available for OHV use under Alternative 4 would be similar to Alternative 2, the increased intensity (i.e., concentration of OHV users) is expected to increase available visitor supply by at least 20 percent over Alternative 2. Even so, the visitor supply under Alternative 4 may be exceeded under Alternative 4 on major holiday weekends. However, the annual visitor supply would be approximately 2.6 million visitors (39 weekends x 55,998 visitor supply x 1.2). This supply is well above the anticipated high range of future visits expected under Alternative 4 of approximately 1.8 million. Therefore, overall access at ISDRA would be maintained.

### **Other Management Actions**

Impacts related to other management actions (e.g., facility development, nighttime closures, etc.) would be similar to those discussed previously under Alternative 2.

## **4.1.3 Mitigation Measures**

As noted above under Assumptions and Assessment Guidelines, implementation of the management actions under the action alternatives (2, 3, and 4) is expected to result in beneficial impacts to recreation resources. Adverse impacts related to visitor supply noted for Alternative 3 are considered unavoidable as they are based in a management objectives and actions designed to minimize visitor supply and maximize natural and cultural resources conservation. Adverse impacts associated with overcrowding and potential recreational use conflicts under the No Action (Alternative 1) would be best mitigated through implementation of one of the action alternatives.



## 4.2 BIOLOGICAL RESOURCES

This section evaluates the project alternatives in terms of their potential impacts to biological resources. Biological resources are categorized as habitat types, special-status plants, and special-status and endemic wildlife as described in Chapter 3, Affected Environment. The Biological Assessment for the project also addresses specific impacts to, and mitigation for, the Peirson's milk-vetch, desert tortoise, and flat-tailed horned lizard. The Biological Assessment is appended to this DEIS (Appendix B).

### 4.2.1 Assumptions and Assessment Guidelines

Impacts to biological resources, as discussed in this section, are assumed to be adverse unless stated otherwise. The baseline conditions for this analysis are described as Alternative 1 (see Chapter 2). Analysis of the potential impacts focuses on changes in anticipated patterns of recreation use, both location and intensity, that would result from implementing an alternative.

Alternative 1 does not include the designation of management areas and ROS classifications as described for the action alternatives (Alternatives 2, 3 and 4). For Alternatives 2, 3, and 4, the nine management areas described in Chapter 2 will be collectively referred to as the Plan Area. The assessment of changes in the recreation use patterns of these three alternatives is based on changes in ROS classifications as described in Section 4.1, Recreation Resource. The ROS classifications designate the extent and nature of OHV activities that characterize a desired future condition associated with a particular alternative. Impacts considered in this chapter are then based on the extent to which the natural environment is likely to be modified by this level of activity, and thereby will serve as an index to potential changes in impacts to biological resources. The relative importance and sensitivity of biological resources in the vicinity of the proposed activities or development was factored into the impact analysis as described in Section 3.2.1 (Regulatory Framework).

For each of the alternatives, the three predominant habitat types (creosote bush scrub, psammophytic scrub, and microphyll woodland) within the ISDRA were considered. These habitat types would not be impacted by OHV recreation within the North Algodones Dunes Wilderness, which is closed to OHV use. Although canal-influenced vegetation is a fourth habitat type, it was not quantified for any of the alternatives because this habitat type is not anticipated to receive impacts as a consequence of OHV use. Such vegetation is on the margin of canals, in situations that are not suitable for OHV activity, and are consequently avoided by OHV users.

### 4.2.2 Impacts

#### 4.2.2.1 Alternative 1

Under Alternative 1, the No Action Alternative, the ISDRA would continue to be managed based on the existing and approved management policies of the 1987 RAMP. Therefore, recreational facility development identified in the 1987 RAMP would be implemented. In addition, this alternative includes the designation of the North Algodones Dunes Wilderness Area, federal listing of



the Peirson's milk-vetch as a threatened species, and the release of Wilderness Study Area 362 from further studies.

This alternative does not include the current interim OHV and camping closures. Also, there would be no revised biological monitoring or adaptive management program, new management areas would not be designated, and ROS classifications would not be assigned under this alternative.

Between 1985 and 2000, the number of visits at the ISDRA approximately tripled. This increase in visitor use represents an annual growth rate of approximately 7.5 percent during the period 1985 to 2000. In comparison, the State of California Department of Recreation has estimated growth in statewide OHV activity of approximately 3.5 percent annually. These two estimates represent the range of projected increases in visitation at the ISDRA under Alternative 1.

### Habitat Types

Potential impacts to habitat types including creosote bush scrub, psammophytic scrub, and microphyll woodland are expected to occur under Alternative 1. This is based on the description of Alternative 1 (see Chapter 2) that includes retaining OHV recreational activities in the entire ISDRA (with the exception of the North Algodones Dunes Wilderness Area), and based on the anticipated effects of increased visitor use over time.

The estimated area of each of the three habitat types potentially impacted under Alternative 1 is shown in Table 4.2-1. As shown in this table, the closure of the area to motorized vehicles would result in retaining 27,695 acres of habitat in an undisturbed setting, which represents 16 percent of the ISDRA. Approximately 139,678 acres would remain available to motorized recreational activities, which represents the remaining 84 percent of the ISDRA. In other words, under Alternative 1, 20 percent or less of each habitat type within the ISDRA would be closed to OHV recreational activities.

**Table 4.2-1 Habitat Types by Estimated Area Closed and Open to Motorized Use under Alternative 1**

HABITAT TYPE	CLOSED (ACRES)	PERCENT WILDERNESS AREA CLOSED	OPEN (ACRES)	PERCENT OPEN
Creosote Bush Scrub	3,188	15	18,668	85
Psammophytic Scrub	16,956	16	91,177	84
Microphyll Woodland	7,551	20	29,833	80

On the basis of the allocation of ISDRA lands shown in Table 4.2-1, at least 15 percent of the affected habitat would be closed to OHV use. Therefore, the habitat fragmentation, soils compaction, and other potential impacts discussed below would not occur in these areas. Anticipated direct impacts to areas not



closed to OHV recreational use (the remaining approximately 80 percent of the ISDRA) would include loss, degradation, and fragmentation of habitat, particularly creosote bush scrub and psammophytic scrub. These impacts described below are not substantively different than the baseline conditions (see Chapter 3), and, therefore, the only marginal impacts would be those that would occur from increased visitor use.

Under this alternative, facility development in accordance with the 1987 RAMP would still occur and is anticipated to contribute to potential impacts to habitat. This construction, however, is anticipated to occur in areas already heavily used for OHV recreation (as opposed to areas that contribute to maintaining habitat of the affected species). Therefore, impacts to habitat resulting from facility development are expected to be minimal.

Indirect impact is anticipated as a result of the increased visitor use associated with facility expansion. This includes campground and access improvements resulting in increased use and in localized impacts to these habitat types. Indirect impacts include soil erosion and dust generation. Plants smothered by dust may experience reduced photosynthesis and transpiration, ultimately reducing vegetative cover. As desert environments are not generally conducive to rapid perennial plant growth (including regrowth), revegetation could take decades. Although the central deep sand dunes are not vulnerable to invasions of invasive species, reducing vegetative cover and disturbing soils as a result of recreational activities could increase the potential for such invasions. Invasive species in the eastern and western margins of the Plan Area, where underlying substrate is hard packed, may eventually displace some native vegetation.

### Special-Status Plants

Potential impacts to special-status plants are expected occur under Alternative 1. This assumes that the entire ISDRA, with the exception of the North Algodones Dunes Wilderness Area, would remain open to OHV recreational activities and projected visitor use would increase over time. Special-status plants that may be impacted from OHV and associated recreational development include: Peirson's milk-vetch, Algodones dunes sunflower, Wiggins' croton, giant Spanish needle, and sand food. Direct and indirect adverse impacts are anticipated to be similar to those described for the habitat types. Each of these species is dependent on psammophytic scrub habitat. Under Alternative 1, approximately 16 percent of this habitat type will be off limits to OHV use in the North Algodones Dunes Wilderness Area and 84 percent would be open to OHV use.

### Special-Status and Endemic Wildlife

As with habitat types and special-status plants, potential impacts to special-status and endemic wildlife are expected to occur under Alternative 1. This expectation is based on the assumption that the entire ISDRA, with the exception of the North Algodones Dunes Wilderness Area, will remain open to OHV recreational activities and the projected visitor use would increase over time. Primary impacts to special-status and endemic wildlife include



direct mortality from recreational vehicles. Secondary impacts include destruction of forage and habitat; crushing of burrows; attraction of predators due to improper disposal of food and litter; harassment and illegal collection of wildlife; harassment by unleashed pets; dust, noise, lights associated with OHV and camping activities; and increased potential for invasion of non-native plants.

It has been shown that prolonged noise can adversely affect some lizards and small mammals. Investigations by Brattstrom and Bondello (1983) on the effect of OHV noise included the desert kangaroo rat (*Dipodomys deserti*), desert iguana (*Dipsosaurus dorsalis*), and Mohave fringe-toed lizard (*Uma scoparia*). Desert kangaroo rats and fringe-toed lizards demonstrated an immediate loss of hearing when exposed to OHV sounds of 95 dBA. Recovery of the kangaroo rat hearing took several weeks, during which time they would have been more vulnerable to predation. Effects are more likely where prolonged noise occurs. However, it is not known whether duration of vehicle noise levels anticipate at the ISDRA negatively impact wildlife. A single OHV can generate a noise level of 92 dB(A) at 50 feet, although the duration of the exposure is likely to be quite short as a vehicle passes by. Wildlife exposure to OHV noise is very localized and only at relatively high levels during the six holiday weekend during the year.

OHV activity tends to be concentrated within the psammophytic scrub. As a consequence, some special-status wildlife species such as the Colorado Desert fringe-toed lizard and endemic dune beetles occurring in these dunes would be killed or injured by OHV activity. Access routes through microphyll woodland habitat and open desert wash areas may result in direct impacts to the desert tortoise through running over tortoises or crushing burrows. These activities may also affect Couch's spadefoot toad habitat through disturbance of small ephemeral pools for which this species depends. The tendency for Couch's spadefoot toad to aggregate during breeding season may pose a higher risk from an increase in OHV activity in this area.

For each of the alternatives potential impacts to Colorado Desert fringe-toed lizards and flat-tailed horned lizards were considered in detail. For the Colorado Desert fringe-toed lizard it is assumed that the all areas of psammophytic scrub and creosote bush scrub are occupied habitat. Under Alternative 1, approximately 20,144 acres, or 16 percent, of habitat would be closed to motorized recreation in the North Algodones Dunes Wilderness while approximately 109,845 acres of habitat, or 84 percent, would remain open to OHV use.

To determine the extent to which OHV use may impact the flat-tailed horned lizards, the number of cells (survey units) containing flat-tailed horned lizards observed within the North Algodones Dunes Wilderness Area, and those in the areas open to OHV activities were tallied. The figures used for the analysis of each alternative were derived from 1998 and 2001 data collected by the BLM. The figures reflect the number of cells that contained flat-tailed horned lizards during the surveys, not actual numbers of horned lizards. The number



and percentage of occupied cells containing flat-tailed horned lizards within the areas closed to OHVs and open to OHVs within the ISDRA are presented in Table 4.2-2. As the table shows, a total of 17 and 67 occupied cells are within closed and open areas, respectively.

**Table 4.2-2 Occupied Cells Containing Flat-tailed Horned Lizards in Areas Closed and Open to Motorized Use the ISDRA under Alternative 1**

CLOSED TO OHV USE (OCCUPIED CELLS)	PERCENT WILDERNESS AREA CLOSED	OPEN TO OHV USE (OCCUPIED CELLS)	PERCENT OPEN
17	20	67	80

Source: BLM 1998, 2001B

### 4.2.2.2 Alternative 2

There are two distinct differences in ROS classifications between Alternative 2 and both Alternatives 3 and 4. Under Alternative 2, the Glamis Management Area and Adaptive Management Area will be designated as Roded Natural and Semi-Primitive Motorized, respectively. The management focus for Alternative 2 would be a combined approach to accommodate continued use of the Plan Area for OHV recreational opportunities as well as protection of natural and cultural resources. The key component contributing to resource protection under Alternative 2 is the establishment of the Adaptive Management Area and implementation of an adaptive management program. Management of this area would include evaluating the effects of and revising management actions, as needed, to achieve a balance of providing a high quality recreation opportunities and conserving high value natural resources. Under Alternative 2, the visitor use is expected to increase from 3.5 to 5 percent annually relative to the low end estimated for the baseline. Additionally, the ROS classification of the Adaptive Management Area is expected to slightly increase overall OHV-related visitor use relative to the baseline. Therefore, this use is expected to be higher than under Alternative 3 (the area would be closed) but lower than Alternative 4.

### Habitat Types

Potential impacts to habitat types including creosote bush scrub, psammophytic scrub, and microphyll woodland are expected to decrease overall under Alternative 2, relative to Alternative 1. This conclusion is based on the designation of ROS classifications, implementation of an adaptive management strategy in the Adaptive Management Area, and projected annual visitor use increase differences.

The area of each habitat type under Alternative 2 is shown in Table 4.2-3. The Plan Area encompasses approximately 51,875 acres of creosote bush scrub, 108,658 acres of psammophytic scrub, and 65,382 acres of microphyll woodland totaling 225,915 acres of these three habitat types. These figures were used for the analysis of all action Alternatives. The North Algodones Dunes Wilderness Management Area would provide a total of 27,695 acres closed to motorized recreation, or 12 percent of the Plan Area. The Adaptive



Management Area would provide a total of 33,952 acres of controlled access, or 15 percent of the Plan Area. The Buffer Zone Management Area would provide a total of 58,542 acres of limited use, representing 26 percent of the Plan Area. These three management areas total 120,189 acres that are provided increased habitat protection through controlled access or closure under Alternative 2, representing 53 percent of the Plan Area. The remaining management areas open to OHV use total 105,726 acres, or 47 percent of the Plan Area. Because the Plan Area encompasses an area of predominantly psammophytic scrub, this habitat type has the largest area amongst the habitat types. Sixteen percent or less of each habitat type within the Plan Area is closed to motorized recreation under Alternative 2.

**Table 4.2-3 Habitat Types by Estimated Areas within Closed , Controlled Access, and Open areas under Alternative 2**

HABITAT TYPE	CLOSED TO OHV USE (ACRES)	PERCENT CLOSED	CONTROLLED ACCESS (ACRES)	PERCENT CONTROLLED ACCESS	OPEN TO OHV USE (ACRES)	PERCENT OPEN
Creosote Bush Scrub	3,188	6	30,019	58	18,668	36
Psammo-phytic Scrub	16,956	16	24,726	23	66,976	61
Microphyll Woodland	7,551	12	37,749	58	20,082	30

Moderate facility development, campground improvements, and road maintenance are anticipated under Alternative 2, and are expected to result in impacts to habitats similar to those described under Alternative 1. However, impacts to habitat within the Adaptive Management Area and the area that is encompassed by the Buffer Zone Management Area under Alternative 2 are expected to substantially decrease relative to Alternative 1. Because OHV use would be monitored and controlled within the Adaptive Management Area, only minor impacts to habitat are anticipated. Enforcement of the Adaptive Management Area and Buffer Zone Management Area use would include installing and maintaining signage. This could produce an edge effect along the boundaries, resulting in some loss of perennial vegetation. Concentrated recreational use is anticipated to continue within adjacent open areas, even within the camping areas, and may occasionally lead to unauthorized activity in closed or restricted areas. Creosote bush scrub and microphyll woodland, characterized by large upright woody plants with sharp branches, are generally avoided by OHV users. Therefore, OHV impacts would likely continue to be primarily within psammophytic scrub, which encompasses 108,658 acres or 48 percent of the Plan Area.

#### **Special-Status Plants**

Impacts to special-status plants are expected to decrease under Alternative 2. This conclusion is based on adoption of a adaptive management approach



which entails monitoring special-status plants. Moderate facility development, campground improvements, and road maintenance are anticipated to result in impacts similar to those described under Alternative 1. However, impacts to special-status plants within the Adaptive Management Area and Buffer Zone Management Area are expected to substantially decrease relative as a result of implementing conservation measures. Because OHV use would be controlled within the Adaptive Management Area, disturbance to special-status plants are anticipated on the newly established boundary of the area. Enforcement of the Adaptive Management Area and Buffer Zone Management Area would include installing and maintaining signage. Concentrated recreational use is anticipated within adjacent open areas, and at camping areas, and would result in the disturbance of special-status plants that may occur there. As previously stated, OHV use has been historically concentrated within psammophytic scrub. Therefore, OHV impacts are anticipated to be concentrated within this important habitat type for the five special-status plant species. For Alternative 2, 41,682 acres, or 39 percent, of psammophytic scrub would receive protection either through closed OHV access in the North Algodones Dunes Wilderness or controlled access in the Adaptive Management Area.

### Special-Status and Endemic Wildlife

Impacts to special-status and endemic wildlife are expected to decrease relative as a result of adopting adaptive management measures. Moderate facility development, campground improvements, and road maintenance are anticipated to result in impacts similar to those described under Alternative 1. However, impacts to special-status and endemic wildlife within the Adaptive Management Area and Buffer Zone Management Area are expected to substantially decrease. Because OHV use would be controlled within the Adaptive Management Area, negligible impacts to special-status and endemic wildlife are anticipated. Enforcement of the Adaptive Management Area and Buffer Zone Management Area could produce an edge effect along the boundaries, resulting in loss or displacement of special-status and endemic wildlife there. Concentrated recreational use in the open areas may also result in the loss or displacement of special-status and endemic wildlife. Additionally, OHV activities, and therefore impacts, are anticipated to be concentrated within psammophytic scrub which is an important habitat type for the Colorado Desert fringe-toed lizard.

As for all alternatives, potential impacts to Colorado Desert fringe-toed lizards and flat-tailed horned lizards were considered in detail. For the Colorado Desert fringe-toed lizard it is assumed that the all areas of psammophytic scrub and creosote bush scrub are occupied habitat. Under Alternative 2, approximately 20,144 acres, or 13 percent, of habitat would be closed to motorized recreation in the North Algodones Dunes Wilderness, approximately 54,745 acres of habitat, or 34 percent would be under controlled access within the Adaptive Management Area; and approximately 85,644 acres of habitat, or 53 percent, in areas open to OHV use.



The number of occupied cells (survey units) containing flat-tailed horned lizards observed within the North Algodones Dunes Wilderness Area, the Adaptive Management Area, and those in the open areas were tallied. The figures used for the analysis of each alternative were derived from 1998 and 2001 data collected by the BLM. The figures constitute the number of occupied cells during the surveys and do not represent the actual numbers of flat-tailed horned lizards. The number and percentage of occupied cells containing flat-tailed horned lizards within these areas within the Plan Area are presented in Table 4.2-4. As the table shows, a total of 17, 28 and 67 occupied cells are within areas that would be closed to OHV use, controlled access, and open areas, respectively.

**Table 4.2-4 Cells Containing Flat-tailed Horned Lizards in Areas to be Closed to OHV Use, Subject to Controlled OHV Access, or Open to Motorized Use within the Plan Area under Alternative 2**

CLOSED TO OHVS (OCCUPIED CELLS)	PERCENT CLOSED	CONTROLLED ACCESS OCCUPIED CELLS	PERCENT CONTROLLED ACCESS	OPEN (OCCUPIED CELLS)	PERCENT OPEN
17	15	28	25	67	60

Source: BLM 1998, 2001b

#### 4.2.2.3 Alternative 3

Under Alternative 3, the Plan Area would be managed under the same management area designations as Alternatives 2 and 4, but different ROS classifications would apply to those management areas. The management focus for this alternative would be protection of natural and cultural resources through the use of closures. Accordingly, Alternative 3 would designate the Mammoth, Adaptive, and Buffer Zone Management Areas as Semi-Primitive Non-Motorized. Management of these areas would be much the same as the North Algodones Dunes Wilderness Management Area in terms of natural resources protection resulting from the prohibition of OHV activities, although through-traffic would continue to be permitted on existing roads.

Under Alternative 3, visitor use is expected to slightly increase from 3.5 to 4 percent annually relative to the low end of the baseline. However, the ROS classifications of the Mammoth, Adaptive, and Buffer Zone Management Areas are expected to reduce overall OHV-related visitor use in these areas. Therefore, this growth in visitor use is expected to be lower than either Alternatives 2 or 4 within these three management areas.

#### Habitat Types

Potential impacts to the three predominant habitat types are expected to decrease under Alternative 3 based on the projected modest increases in visitor use and on the impacts extrapolated from the ROS classifications previously described.

As shown in Table 4.2-5, the closure of three management areas to motorized vehicles would result in approximately 131,803 acres of the three habitat types being undisturbed by OHV use in the future, or 58 percent of the Plan Area. This represents the combined total of the Mammoth Management Area, North



Algodones Dunes Wilderness Management Area, Adaptive Management Area, and Buffer Zone Management Area. This is by far the largest area of closure of any of the alternatives. The remaining management areas total of 94,112 acres, or 42 percent of the Plan Area, would remain open to OHV use.

As the table shows, microphyll woodland is provided the greatest percentage of protection from impacts from OHV use under Alternative 3 and compared to the other two habitat types under consideration. Forty-five percent or greater of each habitat type within the Plan Area is provided full protection under Alternative 3.

**Table 4.2-5 Habitat Types by Estimated Areas Closed and Open to Motorized Use within the Plan Area under Alternative 3**

HABITAT TYPE	CLOSED TO OHV USE (ACRES)	PERCENT CLOSED	OPEN TO OHV USE (ACRES)	PERCENT OPEN
Creosote Bush Scrub	34,722	67	17,153	33
Psammophytic Scrub	48,678	45	59,980	55
Microphyll Woodland	48,403	74	16,979	26

Minor facility development, campground improvements, and road maintenance are anticipated to result in similar, but lesser impacts under Alternative 3 than under the other alternatives. The major difference between Alternative 3 and others is that no or negligible impacts to habitats from OHV use are anticipated within the Mammoth, North Algodones Dunes Wilderness, Adaptive, and Buffer Zone Management Areas due to the closures. However, the anticipated edge effect, in the form of crushing of vegetation and soil disturbance along the closed boundaries of these areas, may be substantial relative to that under other alternatives. This may ultimately result in habitat loss along these boundaries. A substantial increase in the concentration of recreational activities in the areas that would remain open to OHV use may also result from a reduction in area available for OHV recreation. Unauthorized activities in the closed areas may also occur. As stated earlier, OHV use has historically been concentrated within psammophytic scrub. However, due to a reduction in area open to OHV recreation under this alternative, increased impacts to creosote bush scrub and microphyll woodland are expected as recreational enthusiasts seek other areas to enjoy their sport. Nonetheless, these potential impacts are considered minor relative to the benefit of protecting habitat within the closed management areas.

#### **Special-Status Plants**

Based on the projected visitor use increases and ROS classifications; impacts to special-status plants are expected to decrease under Alternative 3 relative to the other alternatives. Minor facility development, campground



improvements, and road maintenance are anticipated to result in similar, but lessened impacts relative to other alternatives. The major difference between Alternative 3 and other alternatives is that no OHV impacts to special-status plants are anticipated within the Mammoth, Adaptive, and Buffer Zone Management Areas due to a nonmotorized ROS classification. However, the anticipated edge effect along the closed boundaries may ultimately result in loss of special-status plants along the boundaries. A substantial increase in the concentrated recreational use in the areas still open to OHV use may result in increased losses of special-status plants there. Additionally, OHV impacts are anticipated to be concentrated within psammophytic scrub which is an important habitat type for the five special-status plants. A major feature of the effects of the enactment of this alternative would be that approximately 44,678 acres of psammophytic scrub, or 45 percent of the total habitat type within the ISDRA, would be closed to OHV use.

### **Special-Status and Endemic Wildlife**

Based on the projected visitor use increase and ROS classifications, impacts to special-status and endemic wildlife are expected to decrease under Alternative 3. Minor facility development, campground improvements, and road maintenance are anticipated to result in similar, but lessened, impacts relative to the baseline. The major difference between Alternative 3 and others is that no impacts to special-status and endemic wildlife resulting from OHV use are anticipated within the Mammoth, North Algodones Dunes Wilderness, Adaptive, and Buffer Zone Management Areas due to their closures. However, the anticipated edge effect along the closed boundaries may be substantial. This may ultimately result in loss or displacement of special-status and endemic wildlife along the boundaries. A substantial increase in the concentrated recreational use in the open areas may result in increased impacts to special-status and endemic wildlife. Additionally, OHV impacts are anticipated to be concentrated within psammophytic scrub, which is an important habitat type for the Colorado Desert fringe-toed lizard. Nonetheless, these potential impacts are considered minor relative to the benefit of protecting these species within the closed management areas.

Potential impacts to Colorado Desert fringe-toed lizards and flat-tailed horned lizards were again considered in detail. For the Colorado Desert fringe-toed lizard it is assumed that the all areas of psammophytic scrub and creosote bush scrub are occupied habitat. Under Alternative 3, approximately 83,400 acres or 52 percent of habitat would be closed to motorized recreation; and approximately 77,133 acres of habitat, or 48 percent in areas open to OHV.

As done for other alternatives, the number of cells (survey units) containing flat-tailed horned lizards observed within the areas to be closed to OHV use and those in the open areas were tallied. The figures used for the analysis of each alternative were derived from 1998 and 2001 data collected by the BLM. The figures reflect the number of cells that contained flat-tailed horned lizards during the surveys, do actual numbers of flat-tailed horned lizards within



the ISDRA. The number and percentage of occupied cells containing flat-tailed horned lizards within these areas within the Plan Area are presented in Table 4.2-6. As the table shows, a total of 70 occupied cells, or 62 percent are within closed areas, and 43 or 38 percent are in open areas.

**Table 4.2-6 Cells Containing Flat-tailed Horned Lizards in Areas to be Closed or Open to Motorized Use the ISDRA under Alternative 3**

CLOSED TO OHV USE (OCCUPIED CELLS)	PERCENT CLOSED	OPEN TO OHV USE (OCCUPIED CELLS)	PERCENT OPEN
70	62	43	38

Source: BLM 1998, 2001b

### 4.2.2.4 Alternative 4

Under Alternative 4, the Plan Area would be managed under the same management areas Alternatives 2 and 3 but different ROS classifications. There are two differences in ROS classifications between Alternative 4 and the other alternatives. Under Alternative 4, the Adaptive Management Area and Mammoth Management area would be designated Roaded Natural. These two management areas encompasses a total of approximately 45,566 acres, or 20 percent of the Plan Area.

Glamis Management Area, Dune Buggy Flats Management Area, and Ogilby Management Area would be designated as Rural. These three areas encompasses a total of approximately 64,389 acres or 28 percent of the Plan Area. The Gecko Management Area and Buttercup Management Area would be designated as Urban. These two areas encompasses 29,722 acres, or 13 percent of the Plan Area

The change in ROS classifications under Alternative 4 would result in substantially increased OHV recreational opportunities. The change would also effectively result in implementation of a desired future condition that would accommodate a shift in visitor use from low-moderate under the other alternatives to moderate-high under Alternative 4. The management focus for this alternative would be providing additional facilities to accommodate increased visitation, including new campgrounds, camping, toilets, trash stations, and information kiosks. Under Alternative 4, the visitor use is expected to increase from 3.5 to 6 percent annually relative to the low end of the baseline. Additionally, revising the ROS classifications of the Adaptive Management Area and Glamis Management Area is expected to increase overall OHV-related visitor use. Therefore, this growth rate is expected to be the highest relative to Alternatives 2 and 3.

### Habitat Types

Based on the projected visitor use increases and previously described ROS classifications, potential impacts to habitats are expected to increase under Alternative 4.



The area of each habitat type under Alternative 4 is shown in Table 4.2-7. As shown in this table, the continued closure of the North Algodones Dunes Wilderness Management Area would result in retaining 27,695 acres of habitat in an undisturbed setting. The Adaptive Management Area would provide an additional total of 33,952 acres of controlled vehicle access, however, this areas designation as Road Natural would likely result in increase motorized use and thereby increase impacts. The Buffer Zone Management Area would provide a total of 58,542 acres of controlled use, or 26 percent of the Plan Area. These three management areas total 120,189 acres that are managed on controlled OHV use. This represents 53 percent of the Plan Area. The remaining management areas total 105,726 acres or 47 percent of the Plan Area and would be open to OHV use.

**Table 4.2-7 Habitat Types by Estimated Areas Closed, Controlled Access, and Open to Motorized Use within the Plan Area under Alternative 4**

HABITAT TYPE	CLOSED (ACRES)	PERCENT WILDERNESS AREA CLOSED	CONTROLLED ACCESS (ACRES)	PERCENT CONTROLLED ACCESS	OPEN (ACRES)	PERCENT OPEN
Creosote Bush Scrub	3,188	6	30,019	58	18,668	36
Psammophytic Scrub	16,956	16	24,726	23	66,976	61
Microphyll Woodland	7,551	12	37,749	58	20,082	30

Substantially increased facility development, campground improvements, and road maintenance are anticipated to result in increased impacts to habitats as a result of increased OHV activity. With the ROS designation of the Glamis Management Area as Roaded Rural and Adaptive Management Area as Roaded Natural, impacts to habitat are also anticipated to increase in these management areas as a result of increase recreation. Thus, under this alternative, the greatest difference is the potential increase in impacts to habitats within the Glamis and Adaptive Management Areas. Although the table illustrates the total area of habitat under controlled access as 92,494 acres, impacts to habitat within the Adaptive Management Area are anticipated to be substantially higher than for the other alternatives. As Table 4.2-7 illustrates, microphyll woodland is provided the greatest percentage of closure within the Plan Area. Sixteen percent or less of each habitat type within the Plan Area is closed under Alternative 4.

#### **Special-Status Plants**

Based on the projected annual growth rate increase and ROS classifications, potential impacts to special-status plants are expected to increase under Alternative 4. Increased facility development, campground improvements, and road maintenance are anticipated to result in increased OHV use in the Plan Area, and therefore increased impacts to special-status plants. With the ROS designation of the Glamis Management Area as Rural and the Adaptive



Management Area as Roaded Natural, impacts to special-status plants are anticipated to increase in these management areas as OHV activity increases. Under this Alternative only the 16,956 acres of psammophytic scrub within the North Algodones Dunes Wilderness Area would be the only area supporting the special status plant species that would not experience increase OHV use.

### Special-Status and Endemic Wildlife

Based on the projected annual growth rate increase and ROS classifications, impacts to special-status and endemic wildlife are expected to increase for Alternative 4. Additionally, increased facility development, campground improvements, and road maintenance are anticipated to result in increased OHV activity and, therefore, impacts to special-status and endemic wildlife. With the ROS designation of the Glamis Management Area as Rural and the Adaptive Management Area as Roaded Natural, impacts to special-status and endemic wildlife are anticipated to increase in these management areas as level of OHV activity increases.

As for all alternatives, potential impacts to Colorado Desert fringe-toed lizards and flat-tailed horned lizards were considered in detail. For the Colorado Desert fringe-toed lizard it is assumed that the all areas of psammophytic scrub and creosote bush scrub are occupied habitat. Under Alternative 2, approximately 20,144 acres, or 13 percent, of habitat would be closed to motorized recreation in the North Algodones Dunes Wilderness, approximately 54,745 acres of habitat, or 34 percent would be under controlled access within the Adaptive Management Area; and approximately 85,644 acres of habitat, or 53 percent, in areas open to OHV use.

The number of occupied cells (survey units) containing flat-tailed horned lizards observed within the North Algodones Dunes Wilderness Area, the Adaptive Management Area, and those in the open areas were again tallied. The number and percentage of occupied cells containing flat-tailed horned lizards within these areas within the Plan Area are presented in Table 4.2-8. As the table shows, a total of 17, 28 and 67 occupied cells are within closed, controlled access, and open areas, respectively. It should be borne in mind that, under this alternative, use in the Adaptive Management Area (controlled access) is expected to increase.

**Table 4.2-8 Cells Containing Flat-tailed Horned Lizards in Areas to be Closed to OHV Use, Subject to Controlled Access, or Open to Motorized Use the ISDRA under Alternative 4**

	CLOSED TO OHV USE (OCCUPIED CELLS)	PERCENT CLOSED	CONTROLLED OHV ACCESS (OCCUPIED CELLS)	PERCENT CONTROLLED OHV ACCESS	OPEN TO OHV USE (OCCUPIED CELLS)	PERCENT OPEN
	17	15	28	25	67	60

Source: BLM 1998, 2001b



### 4.2.3 Mitigation Measures

No additional mitigation measures are required beyond those management actions incorporated into the action alternatives.



### 4.3 LAW ENFORCEMENT AND PUBLIC SAFETY

The mission of the BLM is “to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations” (BLM, 2002). This section assesses impacts to law enforcement and public safety as a result of implementing the alternatives presented in Chapter 2 of this DEIS.

#### 4.3.1 Assumptions and Assessment Guidelines

The majority of visitors to the ISDRA are seeking a recreational experience that is consistent with activities that conform to existing laws and public safety. Other visitors, however, are seeking a recreational experience that is unlawful or contributes to threats to public safety (see Chapter 3). Most of these instances of unlawful behavior occur during the six major holiday weekends during the high-use season (i.e., Halloween, Thanksgiving, New Year’s, Martin Luther King Day, President’s Day, and Easter). During these weekends, illegal behavior increases with the increased visitor use.

The objective of all the alternatives assessed in this DEIS is to provide law enforcement staff<sup>1</sup> (and associated equipment and facilities) in numbers sufficient to curtail illegal behavior, thus providing enhanced opportunities for visitors seeking recreational experiences that comply with public safety and are conducted in accordance with pertinent laws.

- For all alternatives (including the No Action), the need for additional law enforcement staff would occur mostly during the six major holiday weekends.
- For all the alternatives, temporary law enforcement staff would continue to be used to ensure public safety during the high visitor use weekends.
- For the action alternatives (Alternatives 2, 3, and 4), the use of temporary law enforcement officers would continue; and additional permanent staff would be hired. Other measures for the action alternatives would include:
  - A ban on alcohol use outside designated camping areas
  - A sundown to sunup closure at Competition Hill (North and South), Oldsmobile Hill, Test Hill, and Patton Valley
  - Posting speed limits

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<sup>1</sup> Law enforcement officers at the ISDRA are responsible for all aspects of law enforcement, including drug- and alcohol-related problems; assaults; traffic violations; fee compliance enforcement; resource issues (e.g., littering, natural feature destruction, hazardous materials, and waste); and medical emergency response (see Chapter 3).



- Regardless of the alternative subsequently implemented, the BLM will continue to respond to illegal activities at the ISDRA in a way that ensures public safety.
- Under all the alternatives (including the No Action Alternative), visitor use is anticipated to increase over time (see Table 4.1-1 of this DEIS) as a result of continuing popularity of the dunes and limitations on other OHV recreational opportunities in the CDCA Plan Area (see Chapter 5).
- Under the action alternatives, various ROS classifications (see Chapter 2 and Section 4.1 of this DEIS) are assigned to the proposed ISDRA management areas. Because the existing illegal behavior is concentrated during the six major holiday weekends (and on these weekends at specific high-use locales), this analysis focuses on the effect of management actions designed to curtail such behavior during those high-use periods, regardless of assigned ROS class.

#### 4.3.2 Impacts

As discussed above, all the alternatives evaluated in this DEIS are based on the premise that the BLM will provide adequate law enforcement to ensure public safety. Because of this underlying assumption, all the alternatives, including the No Action, are anticipated to improve public safety compared with the existing baseline conditions. Because each of the action alternatives would be assigned a different combination of ROS classes for each of the proposed management areas (see Table 2-2 of this DEIS), the main difference in the level of increased level of public safety would be the areas to which law enforcement staff would be deployed within the ISDRA.

Overall, it is anticipated that increasing law enforcement staff, equipment, and facilities (and implementing the management actions), above, would deter visitation by users who engage in the unlawful and/or dangerous activities discussed in Section 3.3. This initial decrease in visitor use, however, would be offset by management actions intended to improve the overall quality of the recreational experience at ISDRA. It is anticipated that new and improved facilities, improved public safety measures, public information encouraging off-peak visits, and other measures would attract visitors seeking OHV recreation experiences consistent with legal activities. The ISDRA would continue to be a popular OHV destination as a result of: (1) decreasing OHV use in other areas of the desert Southwest (see Chapter 5, *Cumulative Impacts*) and (2) the enhanced recreational experience at the ISDRA when illegal activities are curtailed.

Under Alternative 1, the objective to ensure public safety would be accomplished by continued use of permanent and temporary law enforcement staff at the popular high-use areas. Law enforcement activities in the ISDRA would continue in accordance with measures specified in the 1987 RAMP. Development of facilities to support law enforcement (e.g., new ranger stations and increases to personnel and associated equipment) would occur only to the extent directed by the 1987 plan. Law enforcement staff will continue to be provided on the six major holiday weekends in numbers



sufficient to ensure public safety, and the existing staffing measures discussed in Section 3.3.1 would remain in effect.

These conditions would be comparable to the baseline conditions and, therefore, would not contribute to a decrease in conditions of public safety at the ISDRA. The BLM would continue to commit to providing adequate law enforcement staff (and would continue to rely on neighboring jurisdictions to provide temporary staff commensurate to meet the anticipated visitor use projected under this alternative (see Section 4.1 for projected visitor use under each of the alternatives).

Under the action alternatives (Alternatives 2, 3, and 4), public safety is expected to improve compared with baseline conditions because of the proposed increases in permanent law enforcement staff and the additional management measures (e.g., restrictions on alcohol consumption, posting speed limits) in combination with the proposed ROS classes for those alternatives. In addition, for all the action alternatives, an increase in the number of permanent law enforcement personnel would allow for more enforcement per square mile throughout the ISDRA, thus increasing public safety compared with baseline conditions.

These measures, in combination with the continued presence of law enforcement staff on the major holiday weekends, would contribute to conditions of public safety at the ISDRA.



## 4.4 SOCIOECONOMICS

### 4.4.1 Assumptions and Assessment Guidelines

This section presents the socioeconomic impacts of implementing the alternatives presented in Chapter 2. No adverse socioeconomic impacts are expected to occur as a result of implementing any of the alternatives.

Regional economic impacts of recreation are typically assessed on the basis of visitor trip expenditures<sup>2</sup>. The money spent by visitors on food, lodging, and transportation is the input into the local economy. Management alternatives that affect the amount or type of money spent would affect the local economy.

Estimates of total trip expenditures were developed from data on the number of visits to the ISDRA under each of the management alternatives in combination with trip-related expenditures based on a 1993 study developed by the OHV Division of the California Department of Parks and Recreation (California Parks and Recreation, 1997).

Trip-related expenditures (e.g., food, lodging, transportation, and activities) are typically divided into three groups: those made at or near home, those made en route to and from the recreation site, and those made at or near the recreation site. Only expenditures made by nonresidents are relevant for determining economic impacts. These expenditures would include all expenditures made at or near the site as well as a portion of the expenditures made en route.

For this analysis, the following assumptions were made:

- The regions of influence for the economic impact analysis are Imperial County, California, and Yuma County, Arizona. Ninety percent of the visitors to ISDRA are nonresidents of Imperial County.
- Of the total nonresident visitors, 86 percent are from other parts of California while the remaining 14 percent are from Arizona.
- Arizona residents spend approximately 60 percent of their trip expenditures at home. Of the remaining 40 percent, 30 percent is spent in Yuma and 10 percent in Imperial County.
- A visit to the ISDRA represents a 3-day (2-night) stay.
- Because mean trip expenditures are on a per-household basis and visitation data are on a per-person basis, household trip expenditures are divided by three (approximately the number of persons per household or the number of persons per family in California (DOF, 2001)).
- Trip expenditures are the same for OHV and non-OHV visitors.

<sup>2</sup> Expenditures on capital goods are not included because (1) these goods are mostly likely purchased in the visitors' home county /state (in which case none of that money finds its way into the local economy of the recreational area) and (2) there is no easy way of splitting the cost among the various recreation trip destinations.



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- All fees collected by BLM stay within Imperial County.
- The base year of analysis is 1998 for Imperial County and 1997<sup>3</sup> for Yuma County, but the impacts were adjusted to reflect year 2000 price levels.
- Alternative 1 is the same as the baseline condition for comparative analysis.
- Although an initial decrease in visitor use could occur for all the action alternatives (Alternatives 2, 3, and 4), the demand for recreational opportunities at the ISDRA is anticipated to increase; and visitor use is expected to increase commensurately as a result of decreasing OHV recreational opportunities at other desert Southwest sites (See Chapter 5, *Cumulative Impacts*).

For purposes of this analysis, an alternative would have an adverse impact on the economy if it would:

- Cause a temporary or permanent reduction in employment that is substantial (greater than 5 percent) in relation to the existing employment levels
- Result in a decline in total local earnings in the area by 5 percent or more

### 4.4.1.1 Data

Two data sources were used to derive the total trip expenditures by expenditure category. Total number of visits per year to the ISDRA under each alternative was developed from available survey data. A “trip” equates to a 3-day stay at the Dunes and is assumed to be equivalent to the number of visits provided in Table 4.1-1. Trip expenditure data came from the California Department of Parks and Recreation’s Off-Highway Vehicle study. Table 4.4-1 shows the total number of trips under baseline condition and each of the alternatives, while Table 4.4-2 shows the household trip expenditures by expenditure type.

**Table 4.4-1 Estimated Visitor Use and Origination**

ALTERNATIVES	ESTIMATED NUMBER OF VISITS	NUMBER OF HOUSEHOLDS <sup>A</sup>	RESIDENT (IMPERIAL) HOUSEHOLDS	NONRESIDENT HOUSEHOLDS <sup>B</sup>	
				CALIFORNIA <sup>C</sup>	ARIZONA <sup>D</sup>
Baseline Condition	867,753	289,251	28,925	223,880	36,446
All Alternatives – 2002-2003	1,005,000	335,000	301,500	259,290	42,210
2012-2013 Season: Low Estimate					
Alternatives 1, 2, 3 and 4	1,418,000	472,667	425,400	365,844	59,556
2012-2013 Season: High Estimate					
Alternative 1	2,071,000	690,333	621,300	534,318	86,982
Alternative 2	1,637,000	545,667	491,100	422,346	68,754

<sup>3</sup> Available IMPLAN model for Yuma County.



Table 4.4-1 Estimated Visitor Use and Origination

ALTERNATIVES	ESTIMATED NUMBER OF VISITS	NUMBER OF HOUSEHOLDS <sup>a</sup>	RESIDENT (IMPERIAL) HOUSEHOLDS	NONRESIDENT HOUSEHOLDS <sup>b</sup>	
				CALIFORNIA <sup>c</sup>	ARIZONA <sup>d</sup>
Alternative 3	1,488,000	496,000	446,400	383,904	62,496
Alternative 4	1,800,000	600,000	540,000	464,400	75,600

Source: BLM, 2001

<sup>a</sup> Based on the assumption of three persons per household

<sup>b</sup> Households that are not residents of Imperial County (90% of households)

<sup>c</sup> California households outside Imperial County (86% of nonresident households)

<sup>d</sup> Arizona households account for 14% of nonresident households visiting ISDRA and spend about 10% of their trip related expenditures in Imperial County.

Table 4.4-2 Mean Household Trip Expenditures<sup>a</sup> by Expenditure Type

EXPENDITURE TYPE	BLM FLAT FEE IN 1998 \$	HOUSEHOLD TRIP EXPENDITURE (LOWER BOUND) <sup>c</sup> IN 1998 \$	HOUSEHOLD TRIP EXPENDITURE (UPPER BOUND) <sup>d</sup> IN 1998 \$
Fees	616,007		
Food & Beverage		95.27	317.58
Medical		11.68	23.36
Supplies and Services		128.45	256.9
Transportation		24.58	49.16
TOTAL		259.98	647.00

Source: California Department of Parks and Recreation, 1997; BLM, 2001.

Numbers may not add up due to independent rounding.

<sup>a</sup> These are annual and are expected to grow at 3.5% per year.

<sup>b</sup> All of these fees stay within Imperial County.

<sup>c</sup> Lower bound based on the % of mean expenditures spent in County – thus it is less than 100% and varies (e.g., for expenditures on food, it is 30 percent of the upperbound estimate, whereas for the other expenditure categories it is 50 percent).

<sup>d</sup> Upper bound based on estimated expenditure from OHV study – assumed to be 100% of expenditures.

To perform a sensitivity analysis, two estimates were used for each of the categories. The first estimate is the mean household trip expenditures, while the second estimate represents a lower bound on trip expenditures. The lower bound is assumed to represent the estimated portion of the expenditures spent within the local economy. For this study, the following proportions were applied to the trip expenditures to derive the estimates that remain in the local economy under each expenditure category: 30 percent of food expenditures and 50 percent of the expenditures on gas, medical services, and supplies and services. The preceding proportions represent the local contribution and are partially based on estimates developed by Clawson and Knetch (1966) for economies of rural recreational sites near federal reserves. In the case of the lodging category, total fees that BLM collected were used instead of the estimates from the OHV study. BLM collected \$657,578 in total fees in 2000. This translates to \$616,007 in 1998 dollars. Yuma County in Arizona serves as a starting point for some of the visitors to the ISDRA as well as the route



from other parts of Arizona. As such, there are a number of small towns whose business communities are highly dependent on recreational activities in the ISDRA. Any changes in the number and frequency of visitors to the ISDRA is likely to impact these towns. Because Yuma County has a high unemployment rate (27.5 percent in 2000), any alternative that reduces the number of visitors will likely raise the unemployment rate. Assuming that Arizona residents visiting the ISDRA spend approximately 30 percent of their trip expenditures in Yuma County, the following trip expenditures were developed under each of the management alternatives. As with the estimates developed for Imperial County, the low ends represent estimates expected to stay within the local area (i.e., Yuma County).

The estimated total trip expenditures (lower and upper bound) associated with each of the action alternatives (as well as the baseline condition) for Imperial and Yuma County are presented in Tables 4.4-3 and 4.4-4. The estimated total trip expenditures were used to analyze the effects on the economies of the two counties. An IMPLAN (Impact Analysis for Planning) regional input-output model was constructed for each of the two counties. IMPLAN is an input-output modeling and software package that allows the modeler to build economic models of regions for impact analysis purposes.

YUMA COUNTY IMPERIAL COUNTY	TRIP EXPENDITURES	
	ALABAMA	ARIZONA
	201,121	31,466
	256,962	10,212
	244,544	66,596
	241,611	28,986
	242,628	28,712



Table 4.4-3 Total Household Trip Expenditures by Expenditure Type, Imperial County<sup>a</sup> (Million 1998 \$)

EXPENDITURE TYPE	BASELINE	ALTERNATIVES					
		2002-2003 VISITOR ESTIMATE	2012-2013 LOW VISITOR ESTIMATE	2012-2013 HIGH VISITOR ESTIMATES			
		ALL ALTERNATIVES 2002-2003	ALL ALTERNATIVES	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
<i>Lower Bound</i>							
Fees	0.62	0.71	1.01	1.47	1.16	1.06	1.28
Food & Beverage	21.68	25.11	106.27	51.73	40.89	37.17	44.97
Medical	2.66	3.08	13.03	6.34	5.01	4.56	5.51
Supplies and Services	29.23	33.85	143.27	69.75	55.13	50.11	60.62
Transportation	5.59	6.48	27.41	13.35	10.55	9.59	11.60
TOTAL	59.77	69.22	290.99	142.64	112.75	102.49	123.98
<i>Upper Bound</i>							
Fees	0.62	0.71	1.01	1.47	1.16	1.06	1.28
Food & Beverage	72.26	83.69	354.22	172.45	136.31	123.90	149.88
Medical	5.32	6.16	26.06	12.69	10.03	9.12	11.03
Supplies and Services	58.45	67.70	286.54	139.50	110.27	100.23	121.24
Transportation	11.18	12.95	54.83	26.69	21.10	19.18	23.20
TOTAL	147.82	171.20	722.66	352.80	278.87	253.48	306.63

Source: California Department of Parks and Recreation, 1997; BLM, 2001.

Numbers may not add up due to independent rounding.

<sup>a</sup> Imperial County receives all of the expenditures by California residents and 10% of the expenditures by Arizona residents.



Table 4.4-4 Total Household Trip Expenditures by Expenditure Type, Yuma County<sup>a</sup> (Million 1997 \$)

EXPENDITURE TYPE	BASELINE	ALTERNATIVES					
		2002-2003 VISITOR ESTIMATE	2012-2013 LOW VISITOR ESTIMATE	2012-2013 HIGH VISITOR ESTIMATES			
				ALL ALTERNATIVES 2002-2003	ALL ALTERNATIVES	ALTERNATIVE 1	ALTERNATIVE 2
<i>Lower Bound</i>							
Food & Beverage	1.03	1.19	5.03	2.45	1.93	1.76	2.13
Medical	0.13	0.15	0.62	0.30	0.24	0.22	0.26
Supplies and Services	1.38	1.60	6.78	3.30	2.61	2.37	2.87
Transportation	0.26	0.31	1.30	0.63	0.50	0.45	0.55
TOTAL	2.80	3.24	13.72	6.68	5.28	4.80	5.81
<i>Upper Bound</i>							
Food & Beverage	3.42	3.96	16.76	8.16	6.45	5.86	7.09
Medical	0.25	0.29	1.23	0.60	0.47	0.43	0.52
Supplies and Services	2.77	3.20	13.56	6.60	5.22	4.74	5.74
Transportation	0.53	0.61	2.59	1.26	1.00	0.91	1.10
TOTAL	6.97	8.07	34.15	16.62	13.14	11.94	14.45

Source: California Department of Parks and Recreation, 1997; BLM, 2001.

Numbers may not add up due to independent rounding.

<sup>a</sup> Yuma County receives 30% of the expenditures by Arizona residents.



## 4.4.2 Impacts

### 4.4.2.1 Alternative 1

#### Imperial County

Estimated trip expenditures at the ISDRA would range from \$59.8 million to \$147.8 million. Table 4.4-5 shows estimated total household trip expenditures by expenditure types under the baseline condition. These estimates form the basis of the economic impact analysis.

**Table 4.4-5 Total Estimated Household Trip Expenditures  
by Expenditure Type under Baseline Condition, in 1998 Dollars**

EXPENDITURE TYPE	TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$	TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$
Lodging	0.62	0.62
Food and Beverage	21.68	72.26
Medical	2.66	5.32
Supplies and Services	29.23	58.45
Transportation	5.59	11.18
TOTAL	59.77	147.82

Source: BLM, 2001j; California Department of Parks and Recreation, 1997.  
Numbers may not add up due to independent rounding.

The ISDRA would contribute 1,214 to 3,264 in direct employment and between \$23.8 million and \$56.1 million in direct personal income to the Imperial County economy. In addition to the direct economic impacts of visitor expenditures, ISDRA also contributes to the economic well-being of Imperial County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 121 to 304 in indirect employment in the region and between 165 and 410 in induced employment.

Visitor expenditures also generate between \$3.6 million and \$8.5 million in indirect personal income to the region, and between \$4.1 million and \$9.7 million in induced personal income. Table 4.4-6 shows the estimates of direct, indirect, and induced employment and income under the baseline condition.

Employment impacts of the ISDRA under the baseline condition represent between 3 and 8 percent of the total regional employment of 49,800. Total personal income, on the other hand, represents about 1 percent of the total regional personal income (here derived as per capita income of \$17,550 multiplied by the Census 2000 population estimate for Imperial County of 142,361).



**Table 4.4-6 Estimates of Direct, Indirect, and Induced Impacts under the Baseline Condition**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Employment		
Direct	1,214	3,264
Indirect	121	304
Induced	165	410
Total Employment	1,500	3,978
Personal Income		
Direct	\$23.81 million	\$56.13 million
Indirect	\$3.58 million	\$8.54 million
Induced	\$4.08 million	\$9.65 million
Total Income	\$31.48 million	\$74.32 million

Income estimates are in 2000 dollars.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the housing vacancy rate in the county is high (10.3 percent), no adverse impacts on population or housing are expected under the baseline condition.

### Yuma County

Under this alternative, the estimated trip expenditures range from \$2.8 million to about \$6.0 million. Table 4.4-7 shows estimated total household trip expenditures by expenditure types for the baseline condition.

**Table 4.4-7 Total Estimated Household Trip Expenditures by Expenditure Type under the Baseline Condition, in 1997 Dollars**

EXPENDITURE TYPE	TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$	TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$
Food and Beverage	1.03	3.42
Medical	0.13	0.25
Supplies and Services	1.38	2.77
Transportation	0.26	0.53
TOTAL	2.80	6.97

Source: BLM, 2001; California Department of Parks and Recreation, 1997.

Numbers may not add up due to independent rounding.

The ISDRA would contribute 58 to 158 in direct employment and between \$1.0 million and \$2.4 million in direct personal income to the Yuma County economy. In addition to the direct economic impacts of visitor expenditures, the ISDRA also contributes to the economic well-being of Yuma County



through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 10 to 24 in indirect employment in the region and between 9 and 23 in induced employment.

The visitor expenditures also generate between \$0.2 million and \$0.6 million in indirect personal income to the region, and between \$0.2 million and \$0.5 million in induced personal income. Table 4.4-8 shows the estimates of direct, indirect, and induced employment and income under the baseline condition.

**Table 4.4-8 Estimates of Direct, Indirect, and Induced Impacts under the Baseline Condition**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Employment		
Direct	58	158
Indirect	10	24
Induced	9	23
Total Employment	76	205
Personal Income		
Direct	\$0.98 million	\$2.44 million
Indirect	\$0.23 million	\$0.57 million
Induced	\$0.19 million	\$0.48 million
Total Income	\$1.40 million	\$3.49 million

Income estimates are in 2000 dollars.

The employment impacts of the ISDRA under the baseline condition represent between 0.2 and 0.4 percent of the total regional employment of 47,600. Total personal income, on the other hand, represents between zero and 0.1 percent of total regional personal income (here derived as per-capita income of \$18,452 multiplied by the Census 2000 population estimate for Yuma County of 160,026).

#### **4.4.2.2 All Action Alternatives: 2002-2003 Visitor Estimates**

#### **Imperial County**

Under this alternative, estimated trip expenditures range from \$69.2 million to \$171.1 million. Table 4.4-9 shows estimated total household trip expenditures by expenditure types for the action alternatives using the 2002-2003 estimates of visitor use.

The ISDRA would contribute 1,406 to 3,780 in direct employment and between \$27.6 million and \$68.2 million in direct personal income to the Imperial County economy. In addition to the direct economic impacts of visitor expenditures, ISDRA would also contribute to the economic well-being of Imperial County through secondary economic impacts (indirect and



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induced impacts). Visitor expenditures result in 140 to 353 in indirect employment in the region and between 191 and 475 in induced employment.

**Table 4.4-9 Total Estimated Household Trip Expenditures by Expenditure Type under all action Alternatives, 2002-2003 visitor estimates, in 1998 Dollars**

EXPENDITURE TYPE	TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$	TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$
Lodging	0.71	0.71
Food and Beverage	25.11	83.69
Medical	3.08	6.16
Supplies and Services	33.85	67.70
Transportation	6.48	12.95
TOTAL	69.22	171.20

Source: BLM, 2001; California Department of Parks and Recreation, 1997.

Numbers may not add up due to independent rounding.

The visitor expenditures would also generate between \$4.2 million and \$10.5 million in indirect personal income to the region, and between \$4.7 million and \$11.7 million in induced personal income. Table 4.4-10 shows the estimates of direct, indirect, and induced employment and income under the action alternatives using the 2002-2003 estimates of visitor use.

**Table 4.4-10 Estimates of Direct, Indirect, and Induced Impacts under all Action Alternatives, 2002-2003 Visitor Use Estimates**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Employment		
Direct	1,406	3,780
Indirect	140	353
Induced	191	475
Total Employment	1,737	4,607
Personal Income		
Direct	\$27.6million	\$68.2 million
Indirect	\$4.2 million	\$10.5 million
Induced	\$4.7 million	\$11.7 million
Total Personal Income	\$336.5 million	\$90.3 million

Income estimates are in 2000 dollars.

Total employment impacts of the ISDRA under represent between 3 and 9 percent of the total regional employment of 49,800. Total personal income, on the other hand, represent between 3 and 4 percent of total regional personal



income. The anticipated increase in regional employment and income in Imperial County, compared to the baseline conditions, represents a beneficial impact.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under all the action alternatives (using the 2002-2003 visitor use estimates) are negligible, no adverse impacts on population or housing are expected.

### Yuma County

Under this alternative, the estimated trip expenditures range from \$3.2 million to \$8.1 million. Table 4.4-11 shows estimated total household trip expenditures by expenditure types for the action alternatives using the 2002-2003 visitor use estimates.

**Table 4.4-11 Total Estimated Household Trip Expenditures by Expenditure Type, Yuma County in 1997 Dollars**

EXPENDITURE TYPE	TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$	TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$
Food and Beverage	1.19	3.96
Medical	0.15	0.29
Supplies and Services	1.60	3.20
Transportation	0.31	0.61
TOTAL	3.24	8.07

Source: BLM, 2001; California Department of Parks and Recreation, 1997.

Numbers may not add up due to independent rounding.

The ISDRA would contribute 67 to 183 in direct employment and between \$1.1 million and \$2.8 million in direct personal income to the Yuma County economy. In addition to the direct economic impacts of visitor expenditures, the ISDRA would also contribute to the economic well-being of Yuma County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 11 to 28 in indirect employment in the region and between 10 and 26 in induced employment.

The visitor expenditures also generate between \$0.3 million and \$0.7 million in indirect personal income to the region, and between \$0.2 million and \$0.6 million in induced personal income. Table 4.4-12 shows the estimates of direct, indirect, and induced employment and income under the action alternatives using the 2002-2003 visitor use estimates.

**Table 4.4-12 Estimates of Direct, Indirect, and Induced Impacts under All Action Alternatives, 2002-2003 Visitor Use Estimates**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Employment		
Direct	67	183



**Table 4.4-12 Estimates of Direct, Indirect, and Induced Impacts under All Action Alternatives, 2002-2003 Visitor Use Estimates**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Indirect	11	28
Induced	10	26
Total Employment	88	237
Personal Income		
Direct	\$1.13 million	\$2.82 million
Indirect	\$0.26 million	\$0.67 million
Induced	\$0.22 million	\$0.56 million
Total Personal Income	\$1.62 million	\$4.05 million

Income estimates are in 2000 dollars

The employment impacts of the ISDRA under the Recreation Resource Alternative represent between 0.2 and 0.5 percent of the total regional employment of 47,600. Total personal income, on the other hand, represents 0.1 percent of total regional personal income under both the high and low expenditure estimates. Therefore, a negligible to beneficial impact on regional employment and income in Yuma County is anticipated.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under all the action alternatives (using the 2002-2003 visitor use estimates) are negligible, no adverse impacts on population or housing are expected.

#### 4.4.2.3 All Action Alternatives: Low 2012-2013 Visitor Use Estimates

#### Imperial County

Under this alternative, estimated trip expenditures range from \$97.7 million to \$241.6 million. Table 4.4-13 shows estimated total household trip expenditures by expenditure types for all the action Alternatives using low 2012-2013 visitor use estimate.

**Table 4.4-13 Total Estimated Household Trip Expenditures by Expenditure Type under all Alternatives, Low 2012-2013 Visitor Use Estimate, 1998 Dollars**

EXPENDITURE TYPE	TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$	TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$
Lodging	1.01	1.01
Food and Beverage	35.42	118.07
Medical	4.34	8.69
Supplies and Services	47.76	95.51
Transportation	9.14	18.28
TOTAL	97.67	241.56

Source: BLM, 2001; California Department of Parks and Recreation, 1997.

Numbers may not add up due to independent rounding.



The ISDRA would contribute 1,984 to 5,334 in direct employment and between \$38.9 million and \$96.2 million in direct personal income to the Imperial County economy. In addition to the direct economic impacts of visitor expenditures, the ISDRA would also contribute to the economic well-being of Imperial County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 197 to 498 in indirect employment in the region and between 270 and 670 in induced employment.

The visitor expenditures would also generate between \$5.9 million and \$14.8 million in indirect personal income to the region, and between \$6.7 million and \$16.5 million in induced personal income. Table 4.4-14 shows the estimates of direct, indirect, and induced employment and income under all action alternatives and using low 2012-2013 visitor use estimates.

Total employment impacts of the ISDRA under this alternative represent between 5 and 13 percent of the total regional employment of 49,800. Total personal income, on the other hand, represents between 2 and 5 percent of total regional personal income. The anticipated increase in regional employment and income in Imperial County under this alternative, compared to existing conditions, represents a beneficial impact.

**Table 4.4-14 Estimates of Direct, Indirect, and Induced Impacts under All Action Alternatives, 2012-2013 Low Visitor Use Estimates**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Employment		
Direct	1,984	5,334
Indirect	197	498
Induced	270	670
Total Employment	2,450	6,501
Personal Income		
Direct	\$38.91 million	\$96.15 million
Indirect	\$5.85 million	\$14.76 million
Induced	\$6.67 million	\$16.55 million
Total Personal Income	\$51.43 million	\$127.46 million

Income estimates are in 2000 dollars.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under all the action alternatives (using the low 2012-2013 visitor use estimates) are significantly beneficial (based on the significance criteria), no adverse impacts on population or housing are expected.



### Yuma County

Under this alternative, the estimated trip expenditures range from \$4.6 million to \$11.4 million. Table 4.4-15 shows estimated total household trip expenditures by expenditure types for all the action alternatives using low 2012-2013 visitor use estimate.

**Table 4.4-15 Total Estimated Household Trip Expenditures by Expenditure Type under All Action Alternatives, Low 2012-2013 Visitor Use Estimate, 1997 Dollars**

EXPENDITURE TYPE	TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$	TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$
Food and Beverage	1.68	5.59
Medical	0.21	0.41
Supplies and Services	2.26	4.52
Transportation	0.43	0.86
TOTAL	4.57	11.38

Source: BLM, 2001; California Department of Parks and Recreation, 1997.

Numbers may not add up due to independent rounding.

The ISDRA would contribute 94 to 258 in direct employment and between \$1.60 million and \$3.99 million in direct personal income to the Yuma County economy. In addition to the direct economic impacts of visitor expenditures, the ISDRA would also contribute to the economic well-being of Yuma County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 15 to 39 in indirect employment in the region and between 15 and 37 in induced employment.

The visitor expenditures also generate between \$0.4 million and \$0.9 million in indirect personal income to the region, and between \$0.3 million and \$0.8 million in induced personal income. Table 4.4-16 shows the estimates of direct, indirect, and induced employment and income under all the action alternatives using low 2012-2013 visitor use estimate.

**Table 4.4-16 Estimates of Direct, Indirect, and Induced Impacts under All Action Alternatives, Low 2012-2013 Visitor Use Estimate**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Employment		
Direct	94	258
Indirect	15	39
Induced	15	37
Total Employment	124	334
Personal Income		
Direct	\$1.60 million	\$3.99 million
Indirect	\$0.37 million	\$0.94 million



Induced	\$0.31 million	\$0.79 million
Total Personal Income	\$2.28 million	\$5.71 million

Income estimates are in 2000 dollars.

Total employment impacts of the ISDRA under this alternative represent between 0.3 and 0.7 percent of the total regional employment of 47,600. Total personal income, on the other hand, represents between 0.1 and 0.2 percent of total regional personal income. Thus, this alternative would have a negligible to beneficial impact on regional employment and income in Yuma County.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under all the action alternatives (using the low 2012-2013 visitor use estimates) are negligible, no adverse impacts on population or housing are expected.

#### 4.4.2.4 Alternative 1: High 2012-2013 Visitor Use Estimate

#### Imperial County

Estimated trip expenditures range from \$142.6 million to \$352.8 million.

Table 4.4-17 shows estimated total household trip expenditures by expenditure types for Alternative 1 using high 2012-2013 visitor use estimates.

The ISDRA would contribute 2,897 to 7,790 in direct employment and between \$56.8 million and \$140.4 million in direct personal income to the Imperial County economy. In addition to the direct economic impacts of visitor expenditures, ISDRA would also contribute to the economic well-being of Imperial County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 287 to 727 in indirect employment in the region and between 394 and 978 in induced employment.

**Table 4.4-17 Total Estimated Household Trip Expenditures by Expenditure Type under Alternative 1 with High 2012-2013 Visitor Use Estimates, 1998 Dollars**

EXPENDITURE TYPE	TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$	TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$
Lodging	1.47	1.47
Food and Beverage	51.73	172.45
Medical	6.34	12.69
Supplies and Services	69.75	139.50
Transportation	13.35	26.69
TOTAL	142.64	352.80

Source: BLM, 2001; California Department of Parks and Recreation, 1997.

Numbers may not add up due to independent rounding.

The visitor expenditures would also generate between \$8.6 million and \$21.6 million in indirect personal income to the region, and between \$9.7 million and \$24.2 million in induced personal income. Table 4.4-18



shows the estimates of direct, indirect, and induced employment and income under Alternative 1 with high 2012-2013 visitor use estimates.

**Table 4.4-18 Estimates of Direct, Indirect, and Induced Impacts under Alternative 1 with High 2012-2013 Visitor Use Estimates**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Employment		
Direct	2,897	7,790
Indirect	287	727
Induced	394	978
Total Employment	3,578	9,495
Personal Income		
Direct	\$56.83 million	\$140.43 million
Indirect	\$8.55 million	\$21.56 million
Induced	\$9.74 million	\$24.16 million
Total Personal Income	\$75.12 million	\$186.15 million

Income estimates are in 2000 dollars.

Total employment impacts of the ISDRA under Alternative 1 (high 2012-2013 visitor use estimates) represent between 7 and 19 percent of the total regional employment of 49,800. Total personal income, on the other hand, represents between 3 and 7 percent of total regional personal income. The anticipated increase in regional employment and income in Imperial County under this alternative represents a beneficial impact relative to existing conditions.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under Alternative 1 (using the high 2012-2013 visitor use estimates) are significantly beneficial (based on the significance criteria), no adverse impacts on population or housing are expected.

### Yuma County

Under Alternative 1 (high 2012-2013 visitor use estimates), the estimated trip expenditures range from \$6.7 million to \$16.6 million. Table 4.4-19 shows estimated total household trip expenditures by expenditure types for Alternative 1 using high 2012-2013 visitor use estimates.



**Table 4.4-19 Total Estimated Household Trip Expenditures by Expenditure Type under Alternative 1 with High 2012-2013 Visitor Use Estimates, 1997 Dollars**

EXPENDITURE TYPE	TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$	TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$
Food and Beverage	2.45	8.16
Medical	0.30	0.60
Supplies and Services	3.30	6.60
Transportation	0.63	1.26
TOTAL	6.68	16.62

Source: BLM, 2001; California Department of Parks and Recreation, 1997.

Numbers may not add up due to independent rounding.

The ISDRA would contribute 137 to 377 in direct employment and between \$2.3 million and \$5.8 million in direct personal income to the Yuma County economy. In addition to the direct economic impacts of visitor expenditures, ISDRA would also contribute to the economic well-being of Yuma County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 23 to 57 in indirect employment in the region and between 21 and 54 in induced employment.

The visitor expenditures also generate between \$0.5 million and \$1.4 million in indirect personal income to the region, and between \$0.5 million and \$1.2 million in induced personal income. Table 4.4-20 shows the estimates of direct, indirect, and induced employment and income under Alternative 1 with high 2012-2013 visitor use estimates.

**Table 4.4-20 Estimates of Direct, Indirect, and Induced Impacts under Alternative 1 with High 2012-2013 Visitor Use Estimates**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Employment		
Direct	137	377
Indirect	23	57
Induced	21	54
Total Employment	181	488
Personal Income		
Direct	\$2.33 million	\$5.82 million
Indirect	\$0.54 million	\$1.37 million
Induced	\$0.46 million	\$1.15 million
Total Personal Income	\$3.33 million	\$8.34 million

Income estimates are in 2000 dollars.



Total employment impacts of the ISDRA under Alternative 1 (high 2012-2013 visitor use estimates) represent between 0.4 and 1.0 percent of the total regional employment of 47,600. Total personal income, on the other hand, represents between 0.1 and 0.3 percent of total regional personal income. Thus, this alternative would have a negligible to beneficial impact on regional employment and income in Yuma County.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under Alternative 1 (using the high 2012-2013 visitor use estimates) are negligible, no adverse impacts on population or housing are expected.

**4.4.2.5  
Alternative 2:  
High 2012-2013  
Visitor Use  
Estimate**

**Imperial County**

Estimated trip expenditures range from \$112.8 million to \$278.9 million. Table 4.4-21 shows estimated total household trip expenditures by expenditure types for Alternative 2 using high 2012-2013 visitor use estimates.

The ISDRA would contribute 2,290 to 6,158 in direct employment and between \$44.9 million and \$111.0 million in direct personal income to the Imperial County economy. In addition to the direct economic impacts of visitor expenditures, ISDRA would also contribute to the economic well-being of Imperial County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 227 to 574 in indirect employment in the region and between 312 and 773 in induced employment.

**Table 4.4-21 Total Estimated Household Trip Expenditures by Expenditure Type under Alternative 2 with High 2012-2013 Visitor Use Estimates, 1998 Dollars**

EXPENDITURE TYPE	TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$	TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$
Lodging	1.16	1.16
Food and Beverage	40.89	136.31
Medical	5.01	10.03
Supplies and Services	55.13	110.27
Transportation	10.55	21.10
TOTAL	112.75	278.87

Source: BLM, 2001; California Department of Parks and Recreation, 1997.  
Numbers may not add up due to independent rounding.

The visitor expenditures would also generate between \$6.8 million and \$17.0 million in indirect personal income to the region, and between \$7.7 million and \$19.1 million in induced personal income. Table 4.4-22 shows the estimates of direct, indirect, and induced employment and income under Alternative 2 with high 2012-2013 visitor use estimates.



**Table 4.4-22 Estimates of Direct, Indirect, and Induced Impacts under Alternative 2 with High 2012-2013 Visitor Use Estimates**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Employment		
Direct	2,290	6,158
Indirect	227	574
Induced	312	773
Total Employment	2,829	7,505
Personal Income		
Direct	\$44.92 million	\$111.00 million
Indirect	\$6.75 million	\$17.04 million
Induced	\$7.70 million	\$19.10 million
Total Personal Income	\$59.38 million	\$147.14 million

Income estimates are in 2000 dollars.

Total employment impacts of the ISDRA under Alternative 2 (high 2012-2013 visitor use estimates) represent between 6 and 15 percent of the total regional employment of 49,800. Total personal income, on the other hand, represents between 2 and 6 percent of total regional personal income. The anticipated increase in regional employment and income in Imperial County under this alternative represents a beneficial impact relative to existing conditions.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under Alternative 2 (using the high 2012-2013 visitor use estimates) are significantly beneficial (based on the significance criteria), no adverse impacts on population or housing are expected.

### Yuma County

Under Alternative 2 (high 2012-2013 visitor use estimates), the estimated trip expenditures range from \$5.3 million to \$13.1 million. Table 4.4-23 shows estimated total household trip expenditures by expenditure types for Alternative 2 using high 2012-2013 visitor use estimates.



**Table 4.4-23 Total Estimated Household Trip Expenditures by Expenditure Type under Alternative 2 with High 2012-2013 Visitor Use Estimates, 1997 Dollars**

EXPENDITURE TYPE	TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$	TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$
Food and Beverage	1.93	6.45
Medical	0.24	0.47
Supplies and Services	2.61	5.22
Transportation	0.50	1.00
TOTAL	5.28	13.14

Source: BLM, 2001; California Department of Parks and Recreation, 1997.

Numbers may not add up due to independent rounding.

The ISDRA would contribute 108 to 298 in direct employment and between \$1.8 million and \$4.6 million in direct personal income to the Yuma County economy. In addition to the direct economic impacts of visitor expenditures, ISDRA would also contribute to the economic well-being of Yuma County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 18 to 45 in indirect employment in the region and between 17 and 42 in induced employment.

The visitor expenditures also generate between \$0.4 million and \$1.1 million in indirect personal income to the region, and between \$0.4 million and \$0.9 million in induced personal income. Table 4.5-24 shows the estimates of direct, indirect, and induced employment and income under Alternative 2 with high 2012-2013 visitor use estimates.

**Table 4.4-24 Estimates of Direct, Indirect, and Induced Impacts under Alternative 2 with High 2012-2013 Visitor Use Estimates**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Employment		
Direct	108	298
Indirect	18	45
Induced	17	42
Total Employment	143	386
Personal Income		
Direct	\$1.84 million	\$4.60 million
Indirect	\$0.43 million	\$1.08 million
Induced	\$0.36 million	\$0.91 million
Total Personal Income	\$2.63 million	\$6.59 million

Income estimates are in 2000 dollars.

Total employment impacts of the ISDRA under Alternative 2 (high 2012-2013 visitor use estimates) represent between 0.3 and 0.8 percent of the total



regional employment of 47,600. Total personal income, on the other hand, represents between 0.1 and 0.2 percent of total regional personal income. Thus, this alternative would have a negligible to beneficial impact on regional employment and income in Yuma County.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under the Alternative 2 (high 2012-2013 visitor use estimates) are negligible, no adverse impacts on population or housing are expected.

#### 4.4.2.6 Alternative 3: High 2012-2013 Visitor Use Estimate

#### Imperial County

Estimated trip expenditures range from \$102.5 million to \$253.5 million. Table 4.4-25 shows estimated total household trip expenditures by expenditure types for Alternative 3 using high 2012-2013 visitor use estimates.

The ISDRA would contribute 2,081 to 5,597 in direct employment and between \$40.8 million and \$100.9 million in direct personal income to the Imperial County economy. In addition to the direct economic impacts of visitor expenditures, ISDRA would also contribute to the economic well-being of Imperial County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 283 to 522 in indirect employment in the region and between 283 and 703 in induced employment.

**Table 4.4-25 Total Estimated Household Trip Expenditures by Expenditure Type under Alternative 3 with High 2012-2013 Visitor Use Estimates, 1998 Dollars**

EXPENDITURE TYPE	TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$	TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$
Lodging	1.06	1.06
Food and Beverage	37.17	123.90
Medical	4.56	9.12
Supplies and Services	50.11	100.23
Transportation	9.59	19.18
TOTAL	102.49	253.48

Source: BLM, 2001; California Department of Parks and Recreation, 1997.

Numbers may not add up due to independent rounding.

The visitor expenditures would also generate between \$6.1 million and \$15.5 million in indirect personal income to the region, and between \$7.0 million and \$17.4 million in induced personal income. Table 4.4-26 shows the estimates of direct, indirect, and induced employment and income under Alternative 3 with high 2012-2013 visitor use estimates.



**Table 4.4-26 Estimates of Direct, Indirect, and Induced Impacts under Alternative 3 with High 2012-2013 Visitor Use Estimates**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Employment		
Direct	2,081	5,597
Indirect	207	522
Induced	283	703
Total Employment	2,571	6,822
Personal Income		
Direct	\$40.83 million	\$100.90 million
Indirect	\$6.14 million	\$15.49 million
Induced	\$7.00 million	\$17.36 million
Total Personal Income	\$53.97 million	\$133.75 million

Income estimates are in 2000 dollars.

Total employment impacts of the ISDRA under Alternative 3 (high 2012-2013 visitor estimates) represent between 5 and 14 percent of the total regional employment of 49,800. Total personal income, on the other hand, represents between 2 and 5 percent of total regional personal income. The anticipated increase in regional employment and income in Imperial County under this alternative represents a beneficial impact relative to existing conditions.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under Alternative 3 (using the high 2012-2013 visitor use estimates) are beneficial, no adverse impacts on population or housing are expected.

### Yuma County

Under Alternative 3 (high 2012-2013 visitor use estimates), the estimated trip expenditures range from \$4.8 million to \$11.9 million. Table 4.4-27 shows estimated total household trip expenditures by expenditure types for Alternative 3 using high 2012-2013 visitor use estimates.



**Table 4.4-27 Total Estimated Household Trip Expenditures by Expenditure Type under Alternative 3 with High 2012-2013 Visitor Use Estimates, 1997 Dollars**

EXPENDITURE TYPE	TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$	TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$
Food and Beverage	1.76	5.86
Medical	0.22	0.43
Supplies and Services	2.37	4.74
Transportation	0.45	0.91
TOTAL	4.80	11.94

Source: BLM, 2001; California Department of Parks and Recreation, 1997.

Numbers may not add up due to independent rounding.

The ISDRA would contribute 99 to 271 in direct employment and between \$1.7 million and \$4.2 million in direct personal income to the Yuma County economy. In addition to the direct economic impacts of visitor expenditures, ISDRA would also contribute to the economic well-being of Yuma County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 16 to 41 in indirect employment in the region and between 15 and 39 in induced employment.

The visitor expenditures also generate between \$0.4 million and \$1.0 million in indirect personal income to the region, and between \$0.3 million and \$0.8 million in induced personal income. Table 4.4-28 shows the estimates of direct, indirect, and induced employment and income under Alternative 3 with high 2012-2013 visitor use estimates.

**Table 4.4-28 Estimates of Direct, Indirect, and Induced Impacts under Alternative 3 with High 2012-2013 Visitor Use Estimates**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Employment		
Direct	99	271
Indirect	16	41
Induced	15	39
Total Employment	130	351
Personal Income		
Direct	\$1.68 million	\$4.18 million
Indirect	\$0.39 million	\$0.98 million
Induced	\$0.33 million	\$0.83 million
Total Personal Income	\$2.39 million	\$5.99 million

Income estimates are in 2000 dollars.

Total employment impacts of the ISDRA under Alternative 3 (high 2012-2013 visitor use estimates) represent between 0.3 and 0.7 percent of the total



regional employment of 47,600. Total personal income, on the other hand, represents between 0.1 and 0.2 percent of total regional personal income. Thus, this alternative would have a negligible to beneficial impact on regional employment and income in Yuma County.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under Alternative 3 (using the high 2012-2013 visitor use estimates) are negligible, no adverse impacts on population or housing are expected.

#### 4.4.2.7

#### Alternative 4: High 2012-2013 Visitor Use Estimate

#### Imperial County

Estimated trip expenditures range from \$124.0 million to \$306.6 million. Table 4.4-29 shows estimated total household trip expenditures by expenditure types for Alternative 4 using high 2012-2013 visitor use estimates.

The ISDRA would contribute 2,518 to 6,771 in direct employment and between \$49.4 million and \$122.1 million in direct personal income to the Imperial County economy. In addition to the direct economic impacts of visitor expenditures, ISDRA would also contribute to the economic well-being of Imperial County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 250 to 632 in indirect employment in the region and between 343 and 850 in induced employment.

**Table 4.4-29 Total Estimated Household Trip Expenditures by Expenditure Type under Alternative 4 with High 2012-2013 Visitor Use Estimates, 1998 Dollars**

EXPENDITURE TYPE	TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$	TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$
Lodging	1.28	1.28
Food and Beverage	44.97	149.88
Medical	5.51	11.03
Supplies and Services	60.62	121.24
Transportation	11.60	23.20
TOTAL	123.98	306.63

Source: BLM, 2001; California Department of Parks and Recreation, 1997.

Numbers may not add up due to independent rounding.

The visitor expenditures would also generate between \$7.4 million and \$18.7 million in indirect personal income to the region, and between \$8.5 million and \$21.0 million in induced personal income. Table 4.4-30 shows the estimates of direct, indirect, and induced employment and income under Alternative 4 with high 2012-2013 visitor use estimates.



**Table 4.4-30 Estimates of Direct, Indirect, and Induced Impacts under Alternative 4 with High 2012-2013 Visitor Use Estimates**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Employment		
Direct	2,581	6,771
Indirect	250	632
Induced	343	850
Total Employment	3,111	8,252
Personal Income		
Direct	\$49.39 million	\$122.05 million
Indirect	\$7.43 million	\$18.74 million
Induced	\$8.47 million	\$21.00 million
Total Personal Income	\$65.29 million	\$161.79 million

Income estimates are in 2000 dollars.

Total employment impacts of the ISDRA under Alternative 4 (high 2012-2013 visitor use estimates) represent between 6 and 17 percent of the total regional employment of 49,800. Total personal income, on the other hand, represents between 3 and 6 percent of total regional personal income. The anticipated increase in regional employment and income in Imperial County under this alternative represents a beneficial impact relative to existing conditions.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under Alternative 4 (using the high 2012-2013 visitor use estimates) are beneficial, no adverse impacts on population or housing are expected.

### **Yuma County**

Under Alternative 4 (high 2012-2013 visitor use estimates), the estimated trip expenditures range from \$5.8 million to \$14.5 million. Table 4.4-31 shows estimated total household trip expenditures by expenditure types for Alternative 4 using high 2012-2013 visitor use estimates.



**Table 4.4-31 Total Estimated Household Trip Expenditures by Expenditure Type under Alternative 4 with High 2012-2013 Visitor Use Estimates, 1997 Dollars**

EXPENDITURE TYPE	TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$	TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$
Food and Beverage	2.13	7.09
Medical	0.26	0.52
Supplies and Services	2.87	5.74
Transportation	0.55	1.10
TOTAL	5.81	14.45

Source: BLM, 2001; California Department of Parks and Recreation, 1997.

Numbers may not add up due to independent rounding.

The ISDRA would contribute 119 to 328 in direct employment and between \$2.0 million and \$5.1 million in direct personal income to the Yuma County economy. In addition to the direct economic impacts of visitor expenditures, ISDRA would also contribute to the economic well-being of Yuma County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 20 to 50 in indirect employment in the region and between 19 and 47 in induced employment.

The visitor expenditures also generate between \$0.5 million and \$1.2 million in indirect personal income to the region, and between \$0.4 million and \$1.0 million in induced personal income. Table 4.4-32 shows the estimates of direct, indirect, and induced employment and income under Alternative 4 with high 2012-2013 visitor use estimates.

**table 4.4-32 Estimates of Direct, Indirect, and Induced Impacts under Alternative 4 with High 2012-2013 Visitor Use Estimates**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Employment		
Direct	119	328
Indirect	20	50
Induced	19	47
Total Employment	157	424
Personal Income		
Direct	\$2.03 million	\$5.06 million
Indirect	\$0.47 million	\$1.19 million
Induced	\$0.40 million	\$1.10 million
Total Personal Income	\$2.90 million	\$7.25 million

Income estimates are in 2000 dollars.

Total employment impacts of the ISDRA under Alternative 4 (high 2012-2013 visitor use estimates) represent between 0.3 and 0.9 percent of the total



regional employment of 47,600. Total personal income, on the other hand, represents between 0.1 and 0.3 percent of total regional personal income. Thus, this alternative would have a negligible to beneficial impact on regional employment and income in Yuma County.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under the Alternative 4 (high 2012-2013 visitor use estimates) are negligible, no adverse impacts on population or housing are expected.

#### **4.4.2.8 Summary of Impacts**

Alternative 1 (high 2012-2013 visitor use estimates) results in the highest socioeconomic benefits in terms of employment and personal income because it is the alternative that results in the highest number of visits. Tables 4.4-33 through 4.4-36 summarize the employment and personal income impacts for Imperial and Yuma Counties. As discussed in the introduction to this section and in Section 3.1 and 4.1, Recreation, it is important to note that much of the economic activity associated with Alternative 1 is attributable to increased visitor use on six major holiday weekends. Many of these visitors are often engaged in illegal activities and public disturbances. The increased revenues of Alternative 1 (in comparison to the other alternatives) must be assessed in consideration of the basic premise of lawful activity that defines those action alternatives (Alternatives 2, 3, and 4). None of the alternatives would result in adverse impacts to socioeconomics.

#### **4.4.3 Environmental Justice Analysis**

This section was prepared in compliance with Presidential Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (EO 12898), dated February 11, 1994. The purpose of this section is to determine whether or not disproportionately high and adverse human health or environmental effects would result to minority and/or low-income populations from implementing the proposed alternatives. This analysis focuses on the populations located within the area potentially affected by the alternatives. In accordance with EO 12898, this analysis documents where minority and low-income populations reside and examines where the high and adverse impacts (as reported in the various environmental analysis sections of this EIS) fall relative to these populations. This section also discusses the specific outreach efforts made to involve minority and low-income populations in the decisionmaking process.

#### **Studies Performed and Coordination Conducted**

##### **Overview of Executive Order 12898**

EO 12898, issued by President Clinton in 1994, requires that “each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations....” In his memorandum transmitting EO 12898 to federal agencies, President Clinton



## Environmental Consequences

**Table 4.4-33 Estimates of Employment Impacts, Imperial County**

EXPENDITURE TYPE	BASELINE	ALTERNATIVES					
		2002-2003 VISITOR ESTIMATE	2012-2013 LOW VISITOR ESTIMATE	2012-2013 HIGH VISITOR ESTIMATES			
		ALL ALTERNATIVES 2002-2003	ALL ALTERNATIVES	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
<i>Lower Bound</i>							
Direct	1,214	1,406	1,984	2,897	2,290	2,081	2,518
Indirect	121	140	197	287	227	207	250
Induced	165	191	270	394	312	283	343
Total Employment	1,500	1,737	2,450	3,578	2,829	2,571	3,111
<i>Upper Bound</i>							
Direct	3,264	3,780	5,334	7,790	6,158	5,597	6,771
Indirect	304	353	498	727	574	522	632
Induced	410	475	670	978	773	703	850
Total Employment	3,978	4,607	6,501	9,495	7,505	6,822	8,252



Table 4.4-34 Estimates of Personal Income Impacts, Imperial County (Million 2000 \$)

EXPENDITURE TYPE	BASELINE	ALTERNATIVES					
		2002-2003 VISITOR ESTIMATE	2012-2013 LOW VISITOR ESTIMATE	2012-2013 HIGH VISITOR ESTIMATES			
		ALL ALTERNATIVES 2002-2003	ALL ALTERNATIVES	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
<i>Lower Bound</i>							
Direct	23.8	27.6	38.91	56.8	44.9	40.8	49.4
Indirect	3.6	4.2	5.85	8.6	6.8	6.1	7.4
Induced	4.1	4.7	6.67	9.7	7.7	7.0	8.5
Total Personal Income	31.5	36.5	51.43	75.1	59.4	54.0	65.3
<i>Upper Bound</i>							
Direct	56.1	68.2	96.15	140.4	111.0	100.9	122.1
Indirect	8.5	10.5	14.76	21.6	17.0	15.5	18.7
Induced	9.7	11.7	16.55	24.2	19.1	17.4	21.0
Total Personal Income	74.3	90.3	127.46	186.2	147.1	133.8	161.8



Table 4.4-35 Estimates of Employment Impacts, Yuma County

EXPENDITURE TYPE	BASELINE	ALTERNATIVES							
		2002-2003 VISITOR ESTIMATE	2012-2013 LOW VISITOR ESTIMATE	2012-2013 HIGH VISITOR ESTIMATES					
				ALL ALTERNATIVES 2002-2003	ALL ALTERNATIVES	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
Lower Bound									
Direct	58	67	94	137	108	99	119		
Indirect	10	11	15	23	18	16	20		
Induced	9	10	15	21	17	15	19		
Total Employment	76	88	124	1811	143	130	157		
Upper Bound									
Direct	158	183	258	377	298	271	328		
Indirect	24	28	39	57	45	41	50		
Induced	23	26	37	54	42	39	47		
Total Employment	205	237	334	488	386	351	424		



TABLE 4.4-36 ESTIMATES OF PERSONAL INCOME IMPACTS, YUMA COUNTY (MILLION 2000 \$)

EXPENDITURE TYPE	BASELINE	ALTERNATIVES					
		2002-2003 VISITOR ESTIMATE	2012-2013 LOW VISITOR ESTIMATE	2012-2013 HIGH VISITOR ESTIMATES			
				ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
<i>Lower Bound</i>							
Direct	1.0	1.1	1.6	2.3	1.8	1.7	20.3
Indirect	0.2	0.3	0.4	0.5	0.4	0.4	0.5
Induced	0.2	0.2	0.3	0.5	0.4	0.3	0.4
Total Personal Income	1.4	1.6	2.3	3.3	2.6	2.4	2.9
<i>Upper Bound</i>							
Direct	2.4	2.8	4.0	5.8	4.6	4.2	5.1
Indirect	0.6	0.7	0.9	1.4	1.1	1.0	1.2
Induced	0.5	0.6	0.8	1.2	0.9	0.8	1.0
Total Personal Income	3.5	4.1	5.7	8.3	6.6	6.0	7.3



further specified that, “each Federal agency shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by the National Environmental Policy Act of 1969.” Guidance on how to implement EO 12898 and conduct an Environmental Justice analysis has been issued by the President’s Council on Environmental Quality (CEQ, 1997).

### **Methodology and Approach**

The alternatives were evaluated for compliance with EO 12898. For this type of analysis, three fundamental evaluation measures are used.

1. A determination is made as to which impacts of the alternatives are high and adverse.

The series of environmental analyses prepared for the ISDRA RAMP EIS were reviewed, and discussions with the environmental professionals who prepared these sections were conducted to determine which environmental or human health impacts could reach the level of high and adverse after proposed mitigation measures were implemented. Neither EO 12898 nor any of the environmental justice guidance documents contains official guidance on the definition of “high and adverse.” For purposes of this analysis, adverse impacts identified by the professional analysts working on this EIS as “significant” under NEPA were considered to be synonymous with high and adverse impacts as described in EO 12898.

2. A determination is made as to whether minority or low-income populations exist within the high and adverse impact zones.

For information on the distribution of minority and low-income populations in the vicinity of the Plan Area, both 2000 and 1990 census data were used. Race and income data were reviewed at the finest level available from the census (i.e., Census Block for race, and Census Block Group for income). At the time of this analysis, race data from the 2000 census were available and were reviewed. Income data from the 2000 census were not scheduled to be released until April 2002. In lieu of these newer data, 1990 census data on income were reviewed.

3. The spatial distribution of high and adverse impacts is reviewed to determine if these impacts are likely to fall disproportionately on the minority or low-income population.

Because there is no specific guidance in EO 12898, the test of disproportionality is made on the basis described in the *U.S. Environmental Protection Agency’s (EPA) Draft Revised Guidance for Investigating Title VI Administrative Complaints Challenging Permits* (U.S. EPA, June 2000). This guidance suggests using two to three standard deviations above the mean as a quantitative measure of disparate effect.



While the first two elements of this approach were conducted, no detailed distribution analysis was required to make a final determination. This was because professional analysts in each environmental and human health discipline reviewed for this EIS determined that no high and adverse (i.e., NEPA significant) human health or environmental effects were expected to remain after implementation of proposed mitigation measures.

### **Outreach to Minority and Low-Income Populations**

EO 12898 requires federal agencies to ensure effective public participation and access to information. Consequently, a key component of compliance with EO 12898 is outreach to the potentially affected minority and/or low-income population to discover issues of importance that may not otherwise be apparent. Outreach to affected communities was conducted as part of the decisionmaking process, and this outreach is summarized in Section 1.4 of this DEIS.

The ISDRA extends from the central to the southeastern region of Imperial County, California. The area encompassed by the recreation area boundary and the areas immediately adjacent to this boundary are largely unpopulated (see Chapter 3 for a detailed discussion of the affected environment in the vicinity of ISDRA).

### **Distribution of the Minority Population**

Based on the 2000 census, the total population of Imperial County is 142,361. The minority population comprises approximately 50.6 percent of this total population. Several of the Census Blocks in the vicinity of the ISDRA are above 50 percent minority. These Census Blocks have minority population densities high enough (i.e., greater than 50 percent) to be considered minority populations based on the guidance contained in CEQ (1997).

### **Distribution of the Low-Income Population**

Based on the 1990 census (the most recent census for which income data are available), the total population of Imperial County was 109,303. The low-income population comprised approximately 24 percent of this total population. Unlike the CEQ (1997) guidance on minority population, none of the environmental justice guidance documents contains a quantitative definition of how many low-income individuals it takes to comprise a low-income population. In the absence of guidance, for this analysis the density used to identify minority populations (i.e., 50 percent or greater) was also used to identify low-income populations. There is one Census Block Group southeast of the ISDRA with 50 percent or more low-income population.

As discussed in the Methodology and Approach section above, for purposes of this analysis, NEPA significant adverse impacts are considered synonymous with high and adverse impacts as described in EO 12898. As reported in the series of environmental analyses prepared for this DEIS, and further confirmed through discussions with the environmental professionals who prepared these sections, no significant adverse impacts are expected as a result of implementing the alternatives after proposed mitigation measures are

## **Impact Analysis**



implemented. Consequently, none of the impacts of the vicinity of the Plan Area can be described as high and adverse in the context of EO 12898. Because no high and adverse impacts expected as a result of implementing the alternatives, no high and adverse human health or environmental effects of the alternatives are expected to affect minority or low-income populations disproportionately to the general population. The alternatives are considered to be consistent with the policy established in EO 12898.



## 4.5 LAND USE AND LAND OWNERSHIP

Land use impacts are evaluated in terms of the potential effects of enactment of the alternatives, including the No Action Alternative, on existing and planned land uses in the vicinity of the Plan Area based on the following:

- Inconsistency with applicable land use plans and policies
- Incompatibility with existing land uses in the vicinity of the Plan Area

Land management practices exercised by the BLM, including those in the Plan Area, must be consistent with the FLPMA, as well as other management guidelines and plans that provide for and direct the avoidance of land use conflicts where ever possible. It is therefore assumed that, per these guidelines, review and approval procedures for specific actions under these alternatives would result in avoidance or reduction of potentially adverse land use impacts.

Rights-of-way and leases would potentially be granted within lands that are currently subject to interim closure subject to appropriate environmental and land use conformity review.

As described in Chapter 2, all the alternatives with the exception of the No Action Alternative incorporate the designation of eight management areas within the ISDRA, and one management area surrounding the Recreation Area (the Buffer Zone Management Area). Impacts of the subsequent management measures unique to each of the nine areas, as they pertain to the individual action alternatives, are described below.

From the point of view of the Purpose and Need of updating a recreation area management plan, it is important to note that rights-of-way and other entitlements relate to recreational activities in two ways. They are either (1) obvious and therefore avoided by OHV enthusiasts (e.g., railroads, roadways, transmission lines) or (2) unobtrusive and therefore with no or minor effects on recreational use (e.g., buried utilities). Therefore, in either case, impacts to recreational uses are negligible.

### 4.5.2 Impacts

#### 4.5.2.1

#### **Alternative 1: No Action Alternative**

Under Alternative 1, land use management within the ISDRA would continue to be according to the existing and approved management 1987 *Recreation Area Management Plan*, as well as updated regulations that would constrain full implementation of the 1987 RAMP (e.g., new facilities would not be allowed in the North Algodones Dunes Wilderness Area). The nine management areas common to the action alternatives would not be designated, and associated management actions would not be pursued. Because current practices would continue, this alternative would change land uses only to the extent dictated by the 1987 RAMP. Impacts of these changes on applicable land use plans and policies and existing land uses within the ISDRA are discussed below.



### **Consistency With Land Use Plans and Policies**

Under Alternative 1, the ISDRA would continue to be managed for multiple uses, including recreation and resource protection, as specified in the CDCA Plan and in accordance with other applicable guidelines. No new management areas and associated ROS classes would be designated. The CDPA of 1994 established the approximately 32,240-acre North Algodones Dunes Wilderness, located in the northern portion of the Plan Area. Alternative 1 would result in no change in the management of this area to maintain its wilderness status, as provided for in the CDPA. No land use or zoning changes are proposed for private and other lands not managed by the BLM in the Plan Area under this alternative. Alternative 1 would be consistent with the FLPMA, CDPA, CDCA Plan, and Imperial County General Plan and Zoning Regulations. However, implementation of the No Action Alternative would be inconsistent with applicable BLM recreation area management policies that call for periodic updates of management plans so that management practices can adapt to changing land use patterns and intensity.

### **Compatibility with Existing Land Uses**

Under Alternative 1, nonrecreational land uses would likely remain unchanged. The management agreements of the BLM with Bureau of Reclamation and the U.S. Navy would not change. BLM would continue to administer sand and gravel sales, geothermal leases, and oil and gas leases based on the concept of multiple use. Rights-of-way would be maintained consistent with current policies, and new rights-of-way would be granted subject to environmental review and compatibility with existing land uses.

The geographic distribution of recreational and nonrecreational land uses at the ISDRA would be the same under Alternative 1 than under current conditions, and all currently allowed use types would continue to be permitted. The BLM would continue to manage the Recreation Area for multiple uses, including recreation and resource protection. Therefore, land uses under Alternative 1 would be compatible with existing land uses; and no adverse impacts are anticipated.

#### **4.5.2.2 Alternative 2: Recreation and Resource Protection Alternative**

The management emphasis of Alternative 2 is to assure continued use of the ISDRA for motorized and nonmotorized recreational opportunities, and to provide for the protection of natural and cultural resources. The impacts of changes to applicable land use plans and policies consequent to the enactment of Alternative 2, as well as impacts to existing and future land uses at the ISDRA are discussed below.

### **Consistency With Land Use Plans and Policies**

Under Alternative 2, management areas and associated ROS classifications would be established within the Plan Area that would accommodate both recreational opportunities (see Sec. 4.1), including motorized recreation, as well as the protection of biotic and cultural resources. The incorporation of multiple-use management measures for the Plan Area for this alternative



would be consistent with FLPMA as well as specific recreation area management guidelines.

No change to the MUC designations established by the CDCA Plan would occur under implementation of this alternative. Proposed management area and ROS class designations (see Table 2-2 in this DEIS) would be consistent with allowable use under the existing MUCs with regard to the proposed type and intensity of recreational activities and the preservation of the character of the landscape. Therefore, Alternative 2 would be consistent with the CDCA Plan.

No land use or zoning changes are proposed for private and non-BLM lands in the Plan Area. Alternative 2 recreation and resource protection objectives are in conformance with the respective goals and objectives set forth in both the Land Use Element and the Conservation and Open Space Element of the Imperial County General Plan. The County also has zoned the entire ISDRA as S-Open Space, which permits multiple uses consistent with the Conservation and Open Space Element of the General Plan. Therefore, this alternative is consistent with the Imperial County General Plan and Zoning Regulations.

Under Alternative 2, the North Algodones Dunes Wilderness Area would continue to be managed to maintain its wilderness values, as provided for in the CDPA. Therefore, this alternative would be consistent with the CDPA. Alternative 2 also would be consistent with FLPMA, the CDCA Plan, and Imperial County General Plan and Zoning Regulations. Implementation of this alternative would be consistent with applicable land use plans and policies.

### **Compatibility with Existing Land Uses**

Alternative 2 would not result in changes to existing land use patterns in the ISDRA; and the BLM would continue to manage the ISDRA for multiple uses, including recreation and resource protection. The management agreements of the BLM with BOR and the U.S. Navy would not change. BLM would continue to administer sand and gravel sales, geothermal leases, and oil and gas leases based on the concept of multiple use. Such leases would potentially be granted within lands that are currently subject to interim closure.

The geographic distribution of recreational and nonrecreational uses at the ISDRA would be the same under Alternative 2 as compared to the baseline. Overall, proposed land uses under Alternative 2 would be compatible with existing and future land uses; no land use compatibility impacts would result from implementation of this alternative.



### 4.5.2.3

#### **Alternative 3: Natural and Cultural Resource Alternative**

The goal of Alternative 3 is to implement an adaptive management strategy designed to optimize the protection of habitats and populations of sensitive species, while providing opportunities for continued OHV access and other recreational activities within the Plan Area. The effect of the enactment of Alternative 3 on applicable land use plans and policies, as well as existing and future land uses within the Plan Area, is discussed below.

#### **Consistency with Land Use Plans and Policies**

Under Alternative 3, management areas and associated ROS classes would be designated within the Plan Area that would be generally more restrictive to OHV recreational activities. However, the ISDRA would continue to be managed for multiple uses, including recreation. Based on the concept of multiple use, this alternative would be consistent with the FLPMA.

Because OHV use in certain areas within the ISDRA would not be allowed under this alternative, the proposed management area and ROS class designations (see Table 2-2 in this DEIS) would be inconsistent with the permitted uses of the CDCA Plan for the ISDRA, as indicated by the MUC classification system.

No land use or zoning changes are proposed for private and other lands not managed by the BLM in the Plan Area. Alternative 3 would increase the protections provided to the North Algodones Dunes Wilderness Area by placing more restrictive ROS classifications on surrounding management areas. Therefore, this alternative would be consistent with the CDPA. Implementation of this alternative would be consistent with the FLPMA, CDPA, CDCA Plan, and Imperial County General Plan and Zoning Regulations. However, it would be inconsistent with the CDCA Plan.

#### **Compatibility with Existing Land Uses**

Alternative 3 would result in the closure of some ISDRA areas to motorized recreation and limit the intensity level of OHV use in other areas as compared to the baseline. These land use changes would be compatible with surrounding land uses in the ISDRA as nonmotorized recreational land uses would continue in these areas, motorized recreation would continue in other ISDRA areas, and natural and cultural resources would be afforded maximum levels of protection. Therefore, under Alternative 3, the BLM would continue to manage the ISDRA for multiple uses, including recreation and resource protection.

The management agreements of the BLM with the BOR and the U.S. Navy would not change. The BLM would continue to administer sand and gravel sales, geothermal leases, and oil and gas leases based on the concept of multiple use, although leases would likely not be granted on areas permanently closed to vehicles.

While the geographic distribution of recreational and nonrecreational uses at the ISDRA would change under Alternative 3 as compared to the baseline, all currently allowed use types would continue to be permitted. The BLM would continue to manage the ISDRA for multiple uses, including recreation and



resource protection. Therefore, proposed uses under Alternative 3 would be compatible with existing and future land uses; and no land use compatibility impacts are anticipated from implementation of this alternative.

#### 4.5.2.4 Alternative 4: Motorized Recreation Opportunities Alternative

The goal of Alternative 4 is to maximize motorized recreational opportunities within the ISDRA consistent with public scoping comments that had this as a priority. The effect of these changes, as compared to the baseline, on applicable land use plans and policies and existing and future land uses at the ISDRA is discussed below.

##### **Consistency with Land Use Plans and Policies**

Under Alternative 4, management areas and associated ROS classes would be designated within the ISDRA that maximize motorized recreational opportunities. The ISDRA would continue to be managed for multiple uses, including resource protection. Consequently, this alternative would be consistent with the FLPMA.

Because the intensity of OHV use in certain areas within the ISDRA would increase under this alternative, the proposed management area ROS class designations under this alternative (see Table 2-2 in this DEIS) would be inconsistent with the CDCA Plan uses for the ISDRA, as indicated by the MUC system.

No land use or zoning changes are proposed for private and other lands not managed by the BLM in the Plan Area. Alternative 4 management measures are in conformance with the respective goals and objectives set forth in both the Land Use Element and the Conservation and Open Space Element of the Imperial County General Plan. The County also has zoned the entire ISDRA as S-Open Space, which permits multiple uses consistent with the Conservation and Open Space Element of the General Plan. Therefore, this alternative is consistent with the Imperial County General Plan and Zoning Regulations.

The CDPA of 1994 established the approximately 32,240-acre North Algodones Dunes Wilderness, located north of SR-78 and south of the Mammoth Management Area. Enactment of Alternative 4 would not modify or minimize the protections provided to this wilderness as provided in the CDPA. Therefore, this alternative would be consistent with the CDPA.

##### **Compatibility with Existing Land Uses**

Although Alternative 4 would result in an increased intensity of motorized recreational use within the ISDRA as compared to the baseline, this alternative would be compatible with existing and planned land uses in the ISDRA. Motorized and nonmotorized recreational land uses would continue. In addition, the management actions that apply to all alternatives, including the public relations, law enforcement, and adaptive management programs, would encourage protection for natural and cultural land uses by reducing the incidence of encroachment of intensive recreation activity to adjacent areas.



Nonrecreational land uses would remain unchanged as a result of implementing Alternative 4. Management agreements of the BLM with the BOR and the U.S. Navy would not change. BLM would continue to administer sand and gravel sales, geothermal leases, and oil and gas leases based on the concept of multiple use, and leases would potentially be granted within lands that are currently subject to interim closure.

While the geographic distribution of recreational land uses at the ISDRA would change under Alternative 4 as compared to the baseline, all currently allowed use types would continue to be permitted. Therefore, proposed uses under Alternative 4 would be compatible with existing and anticipated future land uses; and no land use impacts are anticipated from implementation of this alternative.

### 4.5.3 Mitigation Measures

No adverse impacts were identified that would require mitigation measures for any project alternative.



## 4.6 VISUAL RESOURCES

All land-disturbing activities have a direct effect on the visual resource. These effects can be either positive or negative, depending on the location, size, color, and viewing location.

Generally speaking, alternatives with high levels of recreation development have the highest potential for decreasing scenic quality. Ground-disturbing activities like road and facilities construction have the potential of not harmonizing with the natural character of the landscape. Dispersed camping opportunities also have the potential to degrade the landscape, but to a much lesser degree.

Alternatives that prescribe management for vegetation and wildlife habitat would have little direct effect on visual resources. In addition, alternatives that remove non-native and other encroaching vegetation would increase the visual variety of a landscape.

Alternatives in which people are encouraged to gather in certain areas have an indirect effect on the visual resource. Vegetation can be trampled, user-built trails tend to appear, and litter detracts from the naturalness of the landscape.

### 4.6.1 Assumptions and Assessment Guidelines

Visual Resource Management classes have been provided for purposes of comparison only to provide a context of potential changes that could occur to the visual landscape. Adverse impacts on the visual resources of the ISDRA would result if the following conditions exist:

- Development proposed as part of an alternative would substantially alter the undisturbed character of the ISDRA landscape, or would be out of character with the landscape.
- View opportunities from established lookouts (e.g., Osborne Lookout or Mesquite Mine Lookout) are obstructed or eliminated.
- View opportunities from known popular areas (other than lookouts) are obstructed or eliminated.

### 4.6.2 Impacts

This alternative would not affect the current status of the North Algodones Dunes Wilderness Area, which prohibits motorized use within its boundaries, but allows nonmotorized recreation use.

#### 4.6.2.1 Alternative 1

It is expected that recreationists would continue to congregate at the popular areas during peak-use times (e.g., major holiday weekends). Due to anticipated increases in visitation (see Table 4.1-1), the visual resources of the landscape during peak periods would appear more crowded at the popular areas when compared to baseline conditions. These additional visitors during peak-use periods will result in temporary (episodic) landscape changes. When the peak-use periods end, use levels and associated visual resources would return to a condition that is similar to the baseline condition. This episodic change in visual resources is not considered an adverse impact.



Evaluating this alternative as shown in Figure 2-1, in the context of the VRM classes depicted in Figure 3.7-1, indicates that the level of existing development associated with this alternative is generally consistent with the associated VRM classes.

### 4.6.2.2

#### Alternative 2

#### Change in ROS Designation

When compared to the baseline condition, the ROS associated with this alternative would allow changes in recreation use, in terms of intensity of use, type of use allowed (motorized versus nonmotorized), and level of facility development. Implementation of this alternative would allow more intense use in the following areas, when compared to the baseline condition:

- Dune Buggy Management Area
- Ogilby Management Area

Implementation of this alternative would allow the same to a little more intense use in the following areas, when compared to the baseline condition:

- Adaptive Management Area—allowing motorized use where it potentially does not exist, as part of the baseline condition.
- Gecko Management Area—allowing roughly the same, to a little less, intense recreation use in the northern portion, and more intense use in the southern portion.
- North Algodones Wilderness Area—the ROS change from Primitive to Semi-Primitive Non-Motorized would allow evidence of users to be visible. Also, motorized use of local roads by law enforcement/resource management personnel would be allowed.
- Buffer Zone—allowing motorized use where it potentially does not exist, as part of the baseline condition.

Implementation of this alternative would allow roughly the same level of use in the following areas, when compared to the baseline condition:

- Glamis Management Area, allowing less intense use in the northern portion, and the southern portion would allow more intense use.

Implementation of this alternative would allow the same, to a little less, intense use in the following areas, when compared to the baseline condition:

- Buttercup Management Area

Implementation of this alternative would allow less intense use in the following areas, when compared to the baseline condition:

- Mammoth Management Area

From a visual resources perspective, allowing more intense use in a management area would change the landscape during periods of peak use. Views of areas during peak use periods from the air or from higher elevations



atop the dunes provide a very different image than views of the same areas during mid-week periods. This short-term change in landscape is adverse, but is not considered significant. This conclusion is based in part on the fact that recreationists visiting ISDRA during peak-use periods have the expectation of seeing crowds.

Allowing more intense use in a particular management area provides views of the inner dunes to more recreationists at one time. This is a visual benefit to the public. Conversely, allowing less intense use in a particular management area provides views of the inner dunes to fewer recreationists at one time. Due to the high level of mobility of the recreationists using the dunes, a lower level of allowable use would not adversely affect view opportunities of the OHV enthusiasts.

This alternative would also include updating the kiosks at the Wildlife Viewing Area. This would enhance the viewing experience of visitors and is considered a beneficial impact.

A ranger station would be constructed at Osborne Overlook. This would not alter views from Osborne Overlook. Visitors traveling on SR-78 would experience an altered view of Osborne Overlook. However, this change would not be substantial to the casual observer.

Applying a dust palliative on the Wash Road has the potential to reduce the dust and, therefore, increase visibility during windy or higher use days. This would result in a visual benefit to the public.

This alternative would provide for the development of pit toilet facilities in Glamis Flats, The Washes, and Dune Buggy Flats areas. This would result in the introduction of structures where they currently do not exist. This would be considered an adverse visual impact.

Closing Oldsmobile Hill, Competition Hill, Test Hill, and Patton Valley at night would result in those areas appearing darker at night (less nighttime glow) due to the elimination of vehicle lights.

In the Buttercup Management Area, several changes to the landscape would occur. Interpretive facilities and parking would be developed near Grays Well Road, a law enforcement facility would be constructed, and camping sites would be designated. These facilities would change the character to a more developed area; however, a Rural ROS designation would allow such changes, and such development would be consistent with the associated VRM Class 4.

Evaluating this alternative as shown in Figure 2-1, in the context of the VRM classes depicted in Figure 3.7-1, indicates that the level of existing development associated with this alternative is generally consistent with the associated VRM classes.

### **Change in Visitation**

Visitation is expected to increase over the years; therefore, the concentration of users is also expected to increase. In addition, more concentrated use would



be allowed in certain areas of the ISDRA with implementation of this alternative. These additional visitors during peak-use periods will result in temporary (episodic) landscape changes. When the peak-use periods end, use levels and associated visual resources would return to a condition that is similar to the baseline condition. This episodic change in visual resources is not considered an adverse impact because it would be temporary in nature.

### 4.6.2.3 Alternative 3

#### Change in ROS Designation

When compared to the baseline condition, the ROS associated with this alternative would affect the intensity of recreation use and the level of facility development.

- North Algodones Wilderness Area—the ROS change from Primitive to Semi-Primitive Non-Motorized would allow evidence of users to be visible. Also, motorized use of local roads by law enforcement/resource management personnel would be allowed.

Implementation of this alternative would allow the same or slightly greater intensity of use in the following areas, when compared to the baseline condition:

- Buttercup Management Area—allowing less intense use.
- Gecko Management Area—allowing less intense use in the northern portion, and more intense use in the southern portion, including a change in allowing motorized vehicles.
- Glamis Management Area—allowing less intense use in the northern portion, and the same, to a little less, level of use in the southern portion, including a change in allowing motorized vehicles.
- Dune Buggy Flats Management Area—allowing less intense use in the northern portion, and the same level of use in the southern portion.
- Buffer Zone—allowing only nonmotorized use where motorized use potentially exists, as part of the baseline condition.

Implementation of this alternative would allow less intense use in the following areas, when compared to the baseline condition:

- Adaptive Management Area, including not allowing motorized vehicles.
- Mammoth Management Area, including not allowing motorized vehicles.

Allowing less intense use in a particular management area provides views of the inner dunes to fewer recreationists at one time. Due to the high level of mobility of the recreationists using the dunes, a lower level of allowable use would not adversely affect view opportunities of the OHV enthusiasts.

This alternative would also include updating the kiosks at the Wildlife Viewing Area. This would enhance the viewing experience of visitors and is considered a beneficial impact.



Applying a dust palliative on the Wash Road has the potential to reduce the dust and, therefore, increase visibility during windy or higher use days. This would result in a visual benefit to the public.

This alternative would provide for the development of pit toilet facilities in Glamis Flats, The Washes, and Dune Buggy Flats areas. This would result in impacts similar to those described above under Alternative 2.

Closing Oldsmobile Hill, Competition Hill, Test Hill, and Patton Valley at night would result in those areas appearing darker at night (less nighttime glow) due to the elimination of vehicle lights.

In the Buttercup Management Area, several changes to the landscape would occur. Interpretive facilities and parking would be developed near Grays Well Road, and a law enforcement facility would be constructed. These facilities would change the character to a more developed area; however, a Roaded Natural ROS designation would allow such changes, and such development would be consistent with the associated VRM Class 3.

Evaluating this alternative as shown in Figure 2-1, in the context of the VRM classes depicted in Figure 3.7-1, indicates that the level of existing development associated with this alternative is generally consistent with the associated VRM classes.

#### **Change in Visitation**

Visitation is expected to increase over the years; therefore, the concentration of users is also expected to increase. However, lower levels of use and development would be allowed in certain areas of the ISDRA with implementation of this alternative. Additional visitors resulting from future growth in attendance during peak-use periods will result in temporary (episodic) landscape changes. When the peak-use periods end, use levels and associated visual resources would return to a condition that is similar to the baseline condition. This episodic change in visual resources is not considered an adverse impact because it would be temporary in nature.

#### **4.6.2.4**

##### **Alternative 4**

#### **Change in ROS Designation**

When compared to the baseline condition, the ROS associated with this alternative would affect the intensity of recreation use and the level of facility development. Implementation of this alternative would allow more intense use in the following areas, when compared to the baseline condition:

- Dune Buggy Management Area
- Adaptive Management Area, allowing motorized use where it potentially does not exist, as part of the baseline condition.
- Ogilby Management Area, allowing motorized use where it potentially does not exist, as part of the baseline condition.



- Gecko Management Area—allowing roughly the same, to a little more, intense recreation use in the northern portion, and more intense use in the southern portion

Implementation of this alternative would allow the same to a little more intense use in the following areas, when compared to the baseline condition:

- Buttercup Management Area
- North Algodones Wilderness Area—allowing the same type of use for the public (i.e., nonmotorized use). However, the ROS change from Primitive to Semi-Primitive Non-Motorized would allow evidence of users to be visible. Also, motorized use of local roads by law enforcement/resource management personnel would be allowed.
- Buffer Zone—allowing motorized use where it potentially does not exist, as part of the baseline condition.
- Glamis Management Area—allowing potentially more intense use in the northern portion, and more intense use in the southern portion.

Implementation of this alternative would allow less intense use in the following areas, when compared to the baseline condition:

- Mammoth Management Area

From a visual resources perspective, allowing more intense use in a management area would change the landscape during periods of peak use. Views of areas during peak-use periods from the air or from higher elevations atop the dunes provide a very different image than views of the same areas during mid-week periods. This short-term change in landscape is adverse, but is not considered significant. This conclusion is based in part on the fact that recreationists visiting ISDRA during peak-use periods have the expectation of seeing crowds.

Allowing more intense use in a particular management area provides views of the inner dunes to more recreationists at one time. This is a visual benefit to the public. Conversely, allowing less intense use in a particular management area provides views of the inner dunes to fewer recreationists at one time. Due to the high level of mobility of the recreationists using the dunes, a lower level of allowable use would not adversely affect view opportunities of the OHV enthusiasts.

The impacts associated with the construction of a ranger station at Osborne Overlook would be the same as the impact discussed previously under Alternative 2. The additional facilities planned in the Glamis Management Area would also result in similar impacts as Alternative 2, but would be marginally greater due to the increased level of facility development provided under this alternative. Applying a dust palliative on the Wash Road has the potential to reduce the dust and, therefore, increase visibility during windy or higher use days. This would result in a visual benefit to the public.



Oldsmobile Hill, Competition Hill, Test Hill, and Patton Valley would not be closed at night if this alternative is implemented. Therefore, the night glow in those areas due to vehicle lights would continue. This represents no change from the baseline condition.

In the Buttercup Management Area, several changes to the landscape would occur. Interpretive facilities and parking would be developed near Grays Well Road, camping sites would be designated, and a law enforcement facility would be constructed. These facilities would change the character to a more developed area; however, an Urban ROS designation would allow such changes, and such development would be consistent with the associated VRM Class 4.

Evaluating this alternative as shown in Figure 2-1, in the context of the VRM classes depicted in Figure 3.7-1, indicates that the level of existing development associated with this alternative is generally consistent with the associated VRM classes.

### **Change in Visitation**

Visitation is expected to increase over the years; therefore, the concentration of users is also expected to increase. In addition, more concentrated use would be allowed in certain areas of the ISDRA with implementation of this alternative. Additional visitors during peak-use periods will result in temporary (episodic) landscape changes. When the peak-use periods end, use levels and associated visual resources would return to a condition that is similar to the baseline condition. This episodic change in visual resources is not considered an adverse impact because it would be temporary in nature.

The following measures should be applied to all new facilities and physical improvements in the ISDRA to ensure they harmonize with the natural landscape. The degree to which an activity harmonizes with the landscape is based on whether its form, line, color, and texture replicate those of the existing landscape.

### **4.6.3 Mitigation Measures**

- Within the North Algodones Dunes Wilderness Areas, no improvements to roadways, new interpretive signs and kiosks, or establishment of vendor areas should occur in this VRM Class 1 area.
- When updating the kiosks at the Wildlife Viewing Area in the VRM Class 1 area (North Algodones Dunes Wilderness Area), use materials that harmonize with the natural landscape.
- Additional interpretive signs, kiosks, and vendor areas should occur in VRM Class 3 or 4 areas only. By definition, interpretive signs, kiosks, and vendor areas should attract attention; therefore, they should not be developed in Class 1 or 2 areas.



## 4.7 WATER RESOURCES

### 4.7.1 Assumptions and Assessment Guidelines

The assessment of impacts assumes that implementation of the project alternatives will include measures required by federal, state, or local law and/or regulation, if applicable. The project alternatives would have an adverse impact on water resources if it would:

- Substantially degrade water quality
- Contaminate a public water supply
- Cause substantial flooding or siltation
- Substantially alter surface flow conditions, patterns, or rates
- Result in water demands that would outstrip supply

The All American Canal, the New Coachella Canal, and ephemeral surface flows are the only surface waters in the project vicinity that have the potential to be affected by planned activities under this alternative. The majority of ephemeral surface flows are located in the eastern portion of the Plan Area.

Some of the OHVs at the ISDRA are expected to leak minor amounts of petroleum products in the normal course of operations. Small amounts of oil and fuel may be spilled or leaked onto the ground surface while refueling OHVs. Although such leakage is considered an adverse consequence of OHV use, it is not expected to affect groundwater quality. This is because leakage would be minor on an individual basis and, as a whole, would occur in a dispersed manner that corresponds to the OHV usage areas in the ISDRA. The potential for oil, grease, and fuel leakage to actually reach groundwater is extremely remote due to the low rainfall levels in the project area, the great depth to groundwater, and the volatile nature of fuel.

The chief impacts on water resources resulting from enactment of any of the alternatives would be to increase or decrease water supply demand by visitors to the ISDRA. Current as well as projected future visitor use levels under any of the alternative scenarios would result in water-use rates that fall well under the available water supply.

The Plan Area is not an area of groundwater recharge, nor would any of the alternatives subject to analysis affect groundwater quality of supplies.

### 4.7.2 Impacts

#### Surface Water Impacts

Impacts to surface waters under Alternative 1 would be negligible. Therefore, significant adverse impacts to surface waters are not anticipated.

#### 4.7.2.1 Alternative 1: No Action Alternative

#### Groundwater Impacts

Negligible impacts to groundwater are anticipated under this alternative. Significant adverse impacts would not occur.

#### Wildlife Guzzler Impacts

Wildlife guzzlers are clearly marked. Potential impacts to the wildlife guzzlers in the Mammoth Management Area and the North Algodones Dune



Wilderness Area would be somewhat greater than under the action alternatives due to the lack of management responses to increased visitor use entailed by the No Action Alternative.

#### 4.7.2.2

##### **Alternative 2: Recreation and Resource Protection Alternative**

#### **Surface Water Impacts**

Negligible increases in impermeable surface would result from limited facility development and road improvements. However, no change in the potential for stormwater runoff to reach the All American Canal or the New Coachella Canal would result; runoff would continue to infiltrate into the surrounding sands and soil rather than flow to the canals. Impacts from OHV activities would be marginally greater than Alternative 3 due to a larger area open to OHV use and higher visitor use. Impacts would be less than under Alternative 4 due to less OHV acreage and lower intensity of use. Therefore, impacts to surface waters under this alternative would be negligible. Significant adverse impacts to surface water would not result from implementation of this alternative.

#### **Groundwater Impacts**

Impacts to groundwater under this alternative would be negligible. Significant adverse impacts to the groundwater would not result from implementation of this alternative.

#### **Wildlife Guzzler Impacts**

As noted above, wildlife guzzlers are clearly marked. The potential for impacts to the wildlife guzzlers in the Mammoth Management Area and the North Algodones Dune Wilderness Area would be less under this alternative due the application of appropriate management procedures accompanying increased visitor use.

#### 4.7.2.3

##### **Alternative 3: Natural and Cultural Resource Alternative**

#### **Surface Water Impacts**

No increase in impermeable surface would result because no facility development and road improvements are proposed under this alternative. No change in the potential for stormwater runoff to reach the All American Canal or the New Coachella Canal would result; runoff would continue to infiltrate into the surrounding sands and soil rather than flow into the canals. Therefore, no impacts to surface water are anticipated from this alternative.

#### **Groundwater Impacts**

The majority of OHV use under this alternative would occur in the area south of SR-78 (including along Gecko Road) and in the vicinity of I-8.

Further, implementation of this alternative would not result in a substantial change from existing conditions. Significant adverse impacts to groundwater quality are not anticipated and mitigation is not proposed.

#### **Wildlife Guzzler Impacts**

Under Alternative 3, the wildlife guzzlers would not be affected by OHV use because the areas where the guzzlers are located (Mammoth Management Area and the North Algodones Dunes Wilderness Area) would be closed to OHV use. No adverse impacts to guzzlers would occur under this alternative.



4.7.2.4

**Alternative 4:  
Motorized  
Recreation  
Opportunities  
Alternative**

**Surface Water Impacts**

Under this alternative, proposed facility developments and road improvements would increase the area of impermeable surfaces in the Plan Area. However, due to the extremely small scale of these improvements compared to the 213,346-acre ISDRA, as well as the location of the improvements relative to ephemeral surface waters, the potential for substantially increased runoff or degraded water quality is considered negligible. Significant impacts to surface water quality are not anticipated.

**Groundwater Impacts**

Impacts to groundwater under this alternative would be negligible because the increased area open to OHV use and the increased level of intensity are not expected to exceed a threshold beyond which percolation of fuel or oil would be expected to occur to the water table. Therefore impacts, including significant adverse impacts, to groundwater would not occur.

**Wildlife Guzzler Impacts**

The enactment of Alternative 4 would not affect the wildlife guzzlers in the North Algodones Dunes Wilderness Area because that area will remain closed to OHV use under this alternative. The two guzzlers in the Mammoth Management Area are within areas designated open for OHV use under this alternative, but are clearly marked. Typically, OHV users avoid structures and areas of high plant growth. Any substantial disturbance of the guzzler area would be considered an adverse impact.

4.7.3

**Mitigation  
Measures**

To avoid potential adverse impacts to the two wildlife guzzlers in the Mammoth Management Area, the area in the immediate vicinity of the guzzlers will be closed to OHV use. This mitigation measure is expected to prevent any adverse impact to the wildlife guzzlers in the Mammoth Management Area.



## 4.8 CULTURAL RESOURCES

### 4.8.1 Assumptions and Assessment Guidelines

Direct impacts on cultural resources are typically related to the level of ground disturbance associated with a project. Ground disturbance, whether for facilities improvements or other activities, is the primary factor affecting archaeological sites and sites with Native American heritage values. Indirect impacts are less associated with the intentional changes being produced by the project. These can include such things as changes to or new travel access routes that lead to greater access to an area, thus increasing the potential for looting. Erosion-control measures that alter deposition patterns and lead to greater erosion or sedimentation can also indirectly affect cultural resources.

The following assumptions were made in determining impacts resulting from the Project Alternatives:

- The current cultural resources database for the ISDRA is representative of the range of resources present.
- Ground disturbance that affects cultural resources can cause irreversible damage to these nonrenewable resources.
- Owing to the nature of shifting sands, and particularly their depth, regardless of the level of inventory, some resources may not be identified.
- Greater access to an area through time means more opportunities for unauthorized collection and looting, as well as more ground disturbance.
- Conversely, reduced access over time leads to reduced opportunities for unauthorized collection and looting, and reduced ground disturbance.
- All effects to cultural resources are adverse effects unless otherwise stated.

Employing these assumptions, and what is currently known of the cultural resources of the project area, extrapolations are made below regarding the extent of impact to cultural resources that would result from enactment of each of the project alternatives, including the No-Action Alternative.

### 4.8.2 Impacts

Given the known cultural resources present in the ISDRA, all alternatives have the potential to affect resources that may qualify for the California Register of Historical Resources (CRHR) and the NRHP. The following discussion provides a ranking of the four project alternatives based on their potential for ground disturbance. Under this ranking, the assessment of the relative potential of an alternative to affect cultural resources is based on the premise that the greater the degree of access to OHV use and the greater the area of potential ground disturbance, the greater the potential for effects. Due to limitations in the existing data, this approach does not take into consideration resource significance, site type and complexity, or variations in resource densities.



### **4.8.2.1 Alternative 1**

Under Alternative 1, the degree of access and relative area of disturbance, and therefore potential for impacts, would be greater than Alternatives 2 and 3, but less than Alternative 4. Management measures currently in place would continue, such as public educational efforts that stress the importance of not disturbing cultural resources, and therefore some reduced impact to cultural resources would be expected, relative to Alternative 4, below.

### **4.8.2.2 Alternative 2**

Alternative 2 would result in a greater area of disturbance than Alternative 3, and, therefore, would have a higher potential for cultural resource impacts. However, Alternative 2 would result in a smaller area of disturbance than Alternatives 1 or 4 (see below) and, therefore, would have a lower potential for cultural resource impacts than these alternatives would.

### **4.8.2.3 Alternative 3**

Enactment of Alternative 3, would result in the most restrictive measures being applied to OHV recreational activity in the ISDRA. Therefore, this alternative would have the least potential for ground disturbance, due to the minimal area open to OHV use, compared to the other Project Alternatives and existing conditions. Enactment of this alternative would also restrict access more than any other alternative, and therefore minimize the possibility of unauthorized collection of cultural resources. Therefore, impacts to cultural resources under this alternative would be less than all other alternatives.

### **4.8.2.4 Alternative 4**

Enactment of this alternative would open portions of the ISDRA to the highest intensity of use (e.g., the Gecko and Buttercup Management Areas would receive a ROS classification of Urban), and open the widest area to OHV recreational activities, relative to other alternatives. Ground disturbing activities would therefore be more extensive and of higher intensity than any other alternative. In addition, the greater level of access would result in a higher frequency of unauthorized disturbance of cultural resources. Therefore, Alternative 4 would have greater impacts to cultural resources than any of the other alternatives.

## **4.8.3 Mitigation Measures**

Potential impacts to cultural resources will be addressed under the 1997 BLM NPA. Supporting the NPA is the State Protocol Agreement between the California Director of the BLM and the State Historic Preservation Officer (SHPO). Under the NPA and State Protocol Agreement, BLM will meet National Historic Preservation Act (NHPA) requirements for addressing effects to historic properties. These include determining the area of potential effect of a given action, performing inventories of the area affected by a proposed action and subjecting any resources encountered to significance evaluation according to the Secretary of the Interior's guidelines, and determining and performing appropriate mitigation if avoidance is not feasible.



## 4.9 TRANSPORTATION AND TRAFFIC

### 4.9.1 Assumptions and Assessment Guidelines

The analysis of potential traffic impact was prepared based on the *Highway Capacity Manual* published by the Transportation Research Board of the National Research Council. In addition, the American State Highway and Transportation Officers' *Geometric Design of Highways and Streets* was considered in determining impact significance.

### 4.9.2 Impacts

Vehicular traffic generated by each alternative is directly proportional to the estimated visits. It is assumed that the average occupancy of vehicles is 3.5 persons per vehicle. Vehicle occupancy for recreational trips is typically higher than that of general traffic. The 3.5 occupancy rate is based on the assumption of three or four occupants in the majority of vehicles and 0.5 percent tour bus use. Table 4.9-1 shows the baseline and projected future annual vehicular traffic for the four project alternatives. Future traffic is projected to the 2012/2013 season, consistent with the assumption that the updated RAMP will be in place at least 10 years. The 2012/2013 traffic is based on the maximum annual growth rates noted previously in Table 4.1-1.

**Table 4.9-1. Project Generated Annual Vehicular Traffic**

PROJECT ALTERNATIVES*	1999/2000 BASELINE		2012/2013	
	VISITS	ANNUAL VEHICLE TRIPS *	VISITS	ANNUAL VEHICLE TRIPS *
Alternative 1	867,753	495,860	2,071,000	1,183,430
Alternative 2	867,753	495,860	1,637,000	935,430
Alternative 3	867,753	495,860	1,488,000	850,290
Alternative 4	867,753	495,860	1,800,000	1,028,570

\* Based on an average vehicle occupancy of 3.5

Annual traffic volume is only a general indicator of traffic impact. The most critical element in highway capacity and LOS is the peak-hour volume (see Section 3.9.2). Based on historical attendance estimates, peak traffic volumes would occur over the six major holiday weekends. Furthermore, for purposes of this analysis, it was assumed that the arrival peak is more critical than the departure peak, that the majority of the arrivals are concentrated in the first 2 days, and that 60 percent arrive on the peak day. Due to the diverse origin of the arriving trips, it is conservative to assume that 20 percent of the peak-day traffic will be concentrated in the peak hour.

As noted previously under Table 3.9-3, the Thanksgiving weekend has historically been the most popular major holiday weekend, with approximately 12 percent of all annual visits. Therefore, the highest volumes of traffic are expected to occur during this period. Potential traffic impacts for each of the alternatives are discussed below, and are based on the worse- case scenario during the Thanksgiving holiday.



#### 4.9.2.1 Alternative 1

As noted above under Table 4.9-1, the highest future (2012/2013 season) annual traffic volumes are projected to occur under Alternative 1. Table 4.9-2 shows the distribution of Alternative 1 peak-hour volumes on major highway segments providing access to the project sites during the Thanksgiving weekend.

**Table 4.9-2. Peak Hour Traffic Distribution and LOS (Alternative 1)**

ACCESS	% DISTRIBUTION	BASELINE				2012/2013			
		HIGHEST ISDRA INBOUND PEAK HOUR	PEAK HOUR INBOUND FOR ISDRA	TOTAL TRAFFIC*	LEVEL OF SERVICE	HIGHEST ISDRA INBOUND PEAK HOUR	PEAK HOUR INBOUND FOR ISDRA	TOTAL TRAFFIC*	LEVEL OF SERVICE
I-8 West	50	3,570	1,790	2,580	C	8,520	4,260	5,550	F
I-8 East	8	3,570	290	1,320	B	8,520	680	2,380	C
SR-78 West	32	3,570	1,140	1,670	E	8,520	2,730	3,590	F
SR-78 East	8	3,570	290	740	C	8,520	680	1,410	D-E
SR-98 West	2	3,570	70	230	B	8,520	170	430	B

\*One-way inbound for I-8, two-way for SR-78 and SR-98

For the highest peak hour on Thanksgiving weekend, SR-78 west of the project site will be operating at LOS E in the baseline year and LOS F in 2012/2013. I-8 west will be operating at LOS F in 2012/2013. LOS E represents a condition near capacity or at capacity and LOS F is the operation condition where capacity is exceeded by demand and a slow moving queue begins to form.

The highest hourly volume of the year is not the criteria for highway design and acceptable LOS. The Association of American State Highway and Transportation Officers (AASHTO) recommends that the 30th highest hourly volume of the year be used as the design capacity of highways. However, for highways with unusual or highly seasonal fluctuation in traffic flow, the 30th hourly volume criterion may not be appropriate. The AASHTO *Geometric Design of Highways and Streets* states that economy dictates a design that results in somewhat less satisfactory traffic operation during seasonal peaks than on rural roads with normal fluctuation, and the public generally will accept such conditions. AASHTO further recommends that it may be desirable to choose an hourly volume for design, which is about 50 percent of the volumes expected to occur during a very few maximum hours of the design year.

Based on the criteria of designing for 50 percent of the highest hourly volume, all segments of highways providing access to the project sites will be operating at LOS D or better. Further, the capacities of I-8 exit ramps will not be exceeded during the design peak hour assuming that the in-bound traffic will be distributed equally to the exits at Grays Well Road and Ogilby Road. Therefore, in the context of normal highway design practice, adverse traffic impacts during a few hours per year would not be considered significant. Adverse (though less than significant) impacts associated with future peak-hour project traffic during major holiday weekends would be mitigated



through implementation of a Traffic Control Plan (TCP), as described below under Section 4.9.3.

#### **4.9.2.2 Alternative 2**

The high estimate for future visitation under Alternative 2 is approximately 20 percent less than the high range estimate under Alternative 1. Because traffic volumes are directly proportionate to visitation, future traffic trips to ISDRA under Alternative 2 would be approximately 20 percent less than under Alternative 1. Therefore, traffic impacts under this alternative would be less than under Alternative 1, and would not be significant. Similar to Alternative 1, potential adverse impacts associated with peak-hour holiday traffic will be mitigated through implementation of a TCP.

#### **4.9.2.3 Alternative 3**

The high estimate for future visitation under Alternative 3 is approximately 30 percent less than the high range estimate under Alternative 1 and about 10 percent less than under Alternative 2. Because traffic volumes are directly proportionate to visitation, the future traffic trips to ISDRA under Alternative 3 would be less than under Alternatives 1 and 2. Adverse impacts during the peak hour of major holiday weekends would be less under this alternative than under Alternatives 1 and 2, and would not be significant. Peak-hour impacts during major holiday weekends would be mitigated through implementation of a TCP.

#### **4.9.2.4 Alternative 4**

The high estimate for future visitation under Alternative 4 is approximately 15 percent less than the high range estimate under Alternative 1. Because traffic volumes are directly proportionate to visitation, future traffic trips to ISDRA under Alternative 4 would be less than under Alternative 1. Therefore, traffic impacts would not be significant. Future traffic volumes under Alternative 4 would be greater than under Alternatives 2 and 3 by approximately 10 and 20 percent, respectively. Therefore, impacts resulting from traffic under this alternative would also be greater than under Alternatives 1 and 2. Similar to Alternative 1, 2 and 3, adverse impacts during the peak hour of major holiday weekends would be mitigated through implementation of a TCP.

#### **4.9.3 Mitigation**

The traffic impacts caused by the few hours of exceptionally high hourly volumes could be mitigated by developing a Special TCP. The TCP should include advance portable changeable message signs used on the freeway and local roads to provide motorist information and direct traffic to alternative exits. The TCP should include dispatching Rangers and California Highway Patrol officers to freeway exits and intersections along the access routes to direct traffic and provide quick response to traffic incidents.



## 4.10 NOISE

Management actions for the entire ISDRA Plan Area (see Table 2.1) that would have the potential to result in increased noise exposure include:

- Recreation – the level and locations of OHV activities within the management planning areas would determine the degree to which offsite locations or campgrounds may be exposed to noise generated from such activities.
- Transportation/Traffic - grading and improvement of roads within the areas potentially would result in increases in vehicular movements in some areas that would, in turn, cause elevated ambient noise levels.
- Access and Facilities – development of new facilities in nondeveloped areas would result in heightened human visitation and localized increases in ambient noise levels in such areas.

On the other hand, many management actions throughout the Plan Area could effectively control noise generated from activities in the management areas. Such actions include:

- ROS classifications would eliminate or limit OHV activities within the management areas.
- The adaptive management plan for biological resources would implement adaptive actions based on information gathered through scientific monitoring. Over time, the adaptive management actions would improve the environmental conditions for biological resources, including exposure to noise, where such measures are deemed necessary.
- A number of public safety measures could have curbing effects on noise generated within the management areas. Such measures include law enforcement, posting of speed limits, and closure of certain areas from sundown to sunup.

### 4.10.1 Assumptions and Assessment Guidelines

The assessment of impacts assumes the implementation of measures required by federal, state, and local laws and regulations. Implementation of a project alternative would normally have an adverse noise impact if it would:

- Substantially increase noise levels above the existing ambient noise levels at sensitive receptor sites (e.g., residences, schools, churches, hospitals)
- Exceed local noise standards at sensitive receptor sites

Impacts are delineated as short-term construction noise or long-term operational noise.



## 4.10.2 Impacts

### 4.10.2.1 Alternative 1

Under Alternative 1, the ISDRA would continue to be managed according to existing and approved management plans prescribed by the 1987 RAMP. All portions of the 1987 RAMP were not fully implemented and may be implemented in the future. This may include facility development activities that would result in short-term construction noise. However, construction noise levels would be temporary and would not impact any noise-sensitive receptors. Significant noise impacts would not result.

Under Alternative 1, recreational usage (primarily OHV and camping) is expected to increase relative to baseline conditions. Consequently, background noise levels are expected to increase in usage areas. However, the increases in noise levels would not be significant because the ISDRA is remote; and there are no sensitive receptors in the vicinity. Although there are no limitations on OHV activity areas under Alternative 1, significant OHV noise impacts are not anticipated to occur.

Title 9, Chapter 2, Section 90702.00 of the Imperial County Ordinance defines noise level limits based on land use zones. The most stringent noise level criterion applied by the county is a nighttime limit of 45 dBA hourly average noise level ( $L_{eq}$ ) for single-family residences. The County's General Plan establishes a 60 dB Community Noise Equivalent Level (CNEL) standard for single-family residential areas. CNEL is a 24-hour weighted average noise level with more weight given to noise levels occurring in the evening and nighttime periods. The CNEL standard of the county is less stringent than the 45 dBA limit.

As mentioned in the Affected Environment (Section 3.10), the nearest sensitive receptors are approximately 7 miles west of the Plan Area. The reference noise level for a single OHV at 50 feet is 92 dBA. Considering only distance attenuation, the noise level at 7 miles from a vehicle would be 35 dBA. This is a worst-case estimation because other factors such as blocking effects of intervening terrain and atmospheric absorption would also reduce noise levels further. Nevertheless, assuming a 35-dBA noise level from a single OHV, it would take 10 OHVs to operate continuously for 1 full hour at the same location to generate an offsite noise level of 45 dBA. Such a scenario is not likely to occur; therefore, OHV noise exposure would not exceed the Imperial County criteria.

### 4.10.2.2 Alternative 2

Facility development under Alternative 2 would include grading of entry roads and construction of interpretive facilities, traffic control areas, ranger stations, parking lots, and pit toilets in some of the management areas. Therefore, construction noise exposure under this alternative would be greater than Alternative 1, which involves minimal or no facility development. However, all construction activities would be temporary and would not affect any noise-sensitive receptors. No significant construction noise impacts are anticipated.

Under Alternative 2, the North Algodones Dunes area would be classified as Semi-Primitive Non-Motorized, meaning no OHV activities would be allowed



in this area. The ROS classification for Mammoth, Adaptive, and Buffer Zone Management areas would be Semi-Primitive Motorized, which limits OHV activities. Therefore, OHV activities would primarily occur in areas south of SR 78. Additionally, Oldsmobile Hill and Competition Hill would be closed from sundown to sun up. OHV activities are not anticipated to cause increased noise levels. Furthermore, no noise-sensitive receptors are located within the project vicinity. OHV activities associated with Alternative 2 would comply with the Imperial County noise standards. Significant OHV noise impacts would not result from the implementation of Alternative 2.

### **4.10.2.3 Alternative 3**

Under Alternative 3, facility developments would include grading of some entry roads and construction of an interpretive facility, traffic control areas, a parking lot, and pit toilets in some of the management areas. Because facility development activity would be less intense, construction noise exposure under this alternative would be lower than under Alternative 2. All construction activities would be temporary and would not be in the vicinity of any noise-sensitive receptors. Therefore, no significant construction noise impacts are anticipated.

Under Alternative 3, the Mammoth, North Algodones, Adaptive, and Buffer Zone Management Areas would be classified as Semi-Primitive Non-Motorized, meaning no OHV activities would be allowed in these areas. The ROS classification for Mammoth, Adaptive, and Buffer Zone Management areas would be Semi-Primitive Motorized, which greatly limits OHV activities. Therefore, OHV activities would be confined to less than half of the overall management area. Additionally, Oldsmobile Hill and Competition Hill would be closed from sundown to sun up. Overall ambient noise levels are not expected to increase as a result of OHV activities. Furthermore, no noise-sensitive receptors are located within the project vicinity. OHV activities associated with Alternative 3 would comply with the Imperial County noise standards. Significant OHV noise impacts would not result from the implementation of Alternative 3.

### **4.10.2.4 Alternative 4**

Under Alternative 4, short-term construction noise exposure would be similar to Alternative 2, which would provide the same level of facility development. All construction activities would be temporary and would not be in the vicinity of any noise-sensitive receptors. Therefore, no significant construction noise impacts are anticipated.

Under Alternative 4, the North Algodones area would be classified as Semi-Primitive Non-Motorized and only the Buffer Zone Management Area would have a Semi-Primitive Motorized ROS classification. Therefore, implementation of this alternative would result in increased OHV activity throughout the ISDRA Planning Area. However, this activity would be more dispersed due to the increase in acreage open to OHV use. Further, no sensitive noise receptors are located within the project vicinity. OHV activities associated with Alternative 4 would comply with all applicable Imperial County noise standards. Adverse noise impacts are not anticipated from implementation of this alternative.



### 4.10.3 Mitigation Measures

Significant adverse noise impacts are not anticipated under any of the project alternatives, including Alternative 1. No mitigation measures are required.



## 4.11 AIR QUALITY

The air quality analysis presented in this section addresses anticipated air quality impacts resulting from implementation of the alternatives presented in Chapter 2 of this DEIS.

### 4.11.1 Assumptions and Assessment Guidelines

The analysis addresses potential local and regional effects from motorized OHV operational sources and on-highway vehicular travel that can be expected as a result of project implementation. A discussion of the methodology used for estimating on-highway vehicle and motorized OHV emissions is provided below.

#### 4.11.1.1 Vehicle Types

Motorized vehicles are the primary source of emissions associated with the proposed four alternative resource management plans. Typically, recreational park and open space land uses do not directly emit significant amount of air pollutants. Vehicular trips to and from these land uses, however, do emit pollutants. Further, an increase in the number of new daily vehicle trips will typically mean an increase in recreational motorized OHV activities at ISDRA.

On-road emissions result from automobile, trucks, and recreational vehicles that travel to and from each site, and are proportional to the distance of vehicle travel. Emissions were calculated based on assumed average round-trip travel distances and EMFAC7G emission factors (CARB, 1997). The emission factors were based on average vehicle speeds, ambient temperature, vehicle weight classification, and engine type. The manufacture of motor vehicles (including OHV models) that do not meet federal and California CAA requirements to reduce tailpipe emissions could be discontinued. The emission estimates do not account for potential emission reductions that would occur if vehicles are converted to clean fuels or if electric vehicles are substituted for gasoline- or diesel-fueled vehicles.

Off-highway emissions result from the operation of mobilized OHVs at the site. Off-road emissions are proportional to the length of activity. All OHV activities can be expected to vary hour-by-hour in their activity. Operational profiles are not available for these OHV activity over the course of an entire day, hour-by-hour. The estimated profiles are based on the concept of peak OHV activity. The peak hour(s) is defined as the hour(s) of the day at which maximum activity occurs. There can be one or more such peaks in a 24-hour period. For the purpose of this air quality analysis, the peak OHV activity levels would occur when an estimated 3.5 person per occupant's on-road vehicle are operating their OHV at the same hour. (Note: the average occupancy rate of on-road vehicle is 3.5 persons per vehicle.) Emissions were calculated by multiplying off-road emission factors by the estimated number of OHVs in operation, and the average operating hour of each piece of OHV. It was assumed that each OHV would operate 6 hours per day. Off-highway emission factors recently published by the CARB were used to calculate emissions.



#### 4.11.1.2 Motorized Vehicle Generated Dust

The principal pollutant of concern emitted by motorized OHV is  $PM_{10}$  because of the relatively large quantity of  $PM_{10}$  dust emissions disturbed by OHVs operating over unpaved surface, and the relatively low ambient air quality standard for  $PM_{10}$ . Soil disturbance activities, such as motorized vehicle travel on the sand dunes, can represent substantial sources of fugitive dust depending on the level of activity, the specific vehicle activities being conducted, and prevailing meteorological conditions. It should be noted that most of the  $PM_{10}$  emissions are from wind erosions, which are a major source of  $PM_{10}$  emissions throughout the ISDRA. In addition, the newly adopted  $PM_{2.5}$  standard is not yet applicable.

$PM_{10}$  dust emissions can adversely affect sensitive receptors (i.e., people who are more susceptible to the adverse impact of air pollutants). These include the elderly, young children, and those individuals suffering from respiratory disorders. Although most dust emissions are readily filtered by human breathing passages, tiny particles can easily bypass this natural filtering system and lodge deep in the lungs. Large-diameter dust, which settles out on nearby foliage and other surfaces, is more a soiling nuisance than a potential health impact. Areas near the OHV sites would be the most susceptible to this nuisance from OHV activities.

Fugitive dust emissions would also be generated from on-highway vehicle travel over paved road that lead to the ISDRA. These fugitive dust emissions were calculated using the methodology in the *CEQA Air Quality Handbook* (SCAQMD, 1993) and *AP-42 Volume I: Stationary Point and Area Sources* (EPA, 1995). Fugitive dust emission calculations are presented in Appendix C, and a summary of emissions is presented in the discussion of alternatives in this analysis.

#### 4.11.1.3 Evaluation Criteria

To determine the severity of impacts, a set of criteria is established for peak daily and annual average concentrations for each pollutant. Emissions below these levels are assumed to present no threat to ambient air quality. An alternative that would generate emissions in excess of these limits would result in adverse impacts to air quality in the region.

Although the Imperial County Air Pollution Control District (ICAPCD) has not developed specific guidelines for evaluating air quality impacts for proposed actions undergoing environmental review, the ICAPCD has established peak daily air pollutant emission limits that, when exceeded, indicate that a source could have an impact on ambient air quality. These emission threshold levels are shown in Table 4.11-1.

EPA sets *de minimis* conformity thresholds, and they refer to the maximum allowable increase in direct and indirect emissions between each projected year and the baseline year for each criteria pollutant in nonattainment and maintenance areas (40 CFR, Section 51.853 [b]). Emissions below these levels are presumed to conform to the SIP within the meaning of the General Conformity Rule. If the total direct and indirect emissions from a federal action would not exceed the thresholds for criteria pollutants in any year, the



federal action is deemed *de minimis* and exempted from conformity requirements. If the total emissions are equal or greater than the *de minimis* levels for the pollutant in any year, a formal conformity determination is required for that pollutant. EPA *de minimis* levels are provided in Table 4.11-1.

Table 4.11-1 Pollutant Emission Criteria

CRITERIA POLLUTANT	ICAPCD CRITERIA (POUNDS PER DAY)	CLEAN AIR ACT DE MINIMIS LEVELS (TONS/YEAR)
CO	550	100
NO <sub>x</sub>	137	100
ROG	137	50
SO <sub>x</sub>	137	100
PM <sub>10</sub>	137	100

Source: ICAPCD, 1993; EPA, 1993.

Note: California defines ROG as VOC (volatile organic compounds)

### 4.11.1.4 Future Baseline

Impacts of the alternatives are assessed by comparison with a future baseline scenario that serves as a benchmark for comparison. This method is used to account for impacts attributed to regional growth, independent of the individual resource management plan alternatives. Development assumptions outside the ISDRA are the same for both the future baseline and all project alternatives. The assumptions are based on current growth forecasts for Imperial County and the SSAB region.

The future baseline is defined as the scenario year 2012-2013 with no changes to interim management, which is the same as the No Action Alternative under Alternative 4. Under the Future baseline, existing attendance for the 1999-2000 season at ISDRA is assumed to increase by 5 percent annually.

Relative to air quality, a notable major emission concern is the PM<sub>10</sub> fugitive dust emissions, both natural and mechanical. Wind-blown dust emission generates approximately 173.35 tons per day (or 346,000 pounds per day) in Imperial County during the year 2000. Entrained dust emission from vehicles on paved and unpaved surfaces generates approximately 3.67 and 38.92 tons per day, respectively, in Imperial County during the year 2000. Any additional construction and off-road recreational activities occurring in the present and near future would increase the PM<sub>10</sub> emission beyond these already significant levels.

Regional air pollutant emissions projected under the future baseline (2012-2013) associated with motor vehicle and OHV operations are shown in Table 4.11-2. A comparison of the future baseline with the existing condition (1999-2000) is also provided.



**Table 4.11-2 Estimated Annual Air Emissions Associated with the Future Baseline**

EMISSION SOURCE	EMISSIONS (TONS/YEAR)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Future Baseline					
On-road Motor Vehicles	149.66	47.42	52.41	1.49	52.94
Off-highway Vehicles	1,086.73	428.57	64.29	9.18	2,568.24
Future Baseline Total (2012-2013)	1,236.39	476.00	116.70	10.67	2,621.19
Baseline Condition (1999-2000)	599.25	230.21	56.38	5.14	1,263.64

Note: Estimated PM<sub>10</sub> emission includes both exhaust and fugitive dust emissions.

Source: CH2M HILL, 2002

Emission estimates for peak daily vehicles were prepared using the EMFAC7G vehicle emission rate model. The estimated number of motor vehicles corresponds to projected traffic volumes for major holiday weekends (refer to Section 4.9). The number of OHVs is proportionate to the total visits provided in Table 4.1-1. Table 4.11-3 summarizes the peak daily vehicle and OHV emissions analyses for year 2012-2013.

#### 4.11.2 Impacts

The following discussion addresses potential air quality impacts from both a peak daily and annual average perspective for each alternative. Peak daily impacts are related to emissions produced during the six major holiday weekends, and typically involve an increase in dust (suspended particulates) as well as OHV and motor vehicle exhaust. Annual emission impacts are related to emissions produced by OHV activities and vehicle trips over a 12-month period.

##### 4.11.2.1 Alternative 1

Annual air pollutant emission estimates for Alternative 1 are provided in Table 4.11-4, along with a comparison to the future baseline. Because annual attendance at the ISDRA is anticipated to increase under this alternative, the annual emission results show that estimated emission levels in 2012-2013 would increase over the emission levels for the future baseline. Therefore, the total net emissions associated with this alternative would exceed the *de minimis* threshold levels. The impacts on air quality would be significant under Alternative 1 scenario.



Table 4.11-3 Estimated Peak Daily Air Emissions Associated with the Future Baseline

EMISSION SOURCE	EMISSIONS (POUNDS/DAY)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Halloween					
On-road Motor Vehicles	5,658.71	1,793.16	1,981.84	56.27	2,001.80
Off-highway Vehicles	11,413.89	4,501.25	675.19	96.46	11,150.37
Total	17,072.60	6,294.41	2,657.02	152.72	13,152.17
Thanksgiving					
On-road Motor Vehicles	9,699.12	3,073.50	3,396.90	96.44	3,431.11
Off-highway Vehicles	19,563.57	7,715.21	1,157.28	165.33	19,111.90
Total	29,262.69	10,788.71	4,554.18	261.77	22,543.00
New Year					
On-road Motor Vehicles	6,465.91	2,048.95	2,264.54	64.29	2,287.34
Off-highway Vehicles	13,042.03	5,143.33	771.50	110.21	12,740.92
Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26
Martin Luther King's Birthday					
On-road Motor Vehicles	4,040.41	1,280.34	1,415.06	40.17	1,429.31
Off-highway Vehicles	8,149.68	3,213.96	482.09	68.87	7,961.53
Total	12,190.09	4,494.30	1,897.15	109.05	9,390.84
President's Day					
On-road Motor Vehicles	8,080.81	2,560.69	2,830.12	80.35	2,858.62
Off-highway Vehicles	16,299.36	6,427.92	964.19	137.74	15,923.05
Total	24,380.17	8,988.60	3,794.31	218.09	18,781.68
Easter					
On-road Motor Vehicles	6,465.91	2,048.95	2,264.54	64.29	2,287.34
Off-highway Vehicles	13,042.03	5,143.33	771.50	110.21	12,740.92
Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26

Note: Estimated PM10 emission includes both exhaust and fugitive dust emissions.

Source: CH2M HILL, 2002



Table 4.11-4 Estimated Annual Air Emissions Associated with Alternative 1

EMISSION SOURCE	EMISSIONS (TONS/YEAR)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Alternative 1					
On-road Motor Vehicles	172.19	54.57	60.31	1.71	60.91
Off-Highway Vehicles	1,250.35	273.52	41.03	10.57	2,954.91
Alternative 1 Total (2012-2013)	1,422.54	322.51	95.18	7.40	120.67
Future Baseline Total (2012-2013)	1,236.39	476.00	116.70	10.67	2,621.19
Total Net Emission	<b>186.15</b>	<b>71.66</b>	<b>17.57</b>	<b>1.61</b>	<b>394.64</b>
<i>De Minimis</i> Thresholds	100.00	100.00	50.00	100.00	100.00

Note: Estimated PM<sub>10</sub> emission includes both exhaust and fugitive dust emissions.

Source: CH2M HILL, 2002

Emission estimates for peak daily vehicles were prepared using the EMFAC7G vehicle emission rate model. The estimated number of motor vehicles corresponds to projected traffic volumes for major holiday weekends (refer to Section 4.9). The number of OHVs is proportionate to the total visits provided in Table 4.1-1. Emission estimates for Alternative 1 and a comparison to the Future baseline are presented in Table 4.11-5.

As shown in Table 4.11-5, the peak daily emissions for CO, NO<sub>x</sub> and PM<sub>10</sub> under this alternative would exceed the ICAPCD daily emission threshold limits.

Because Alternative 1 would result in an increase in peak daily emissions for CO, NO<sub>x</sub> and PM<sub>10</sub>, significant air quality impacts would result from implementation of this alternative.

#### 4.11.2.2 Alternative 2

Annual air pollutant emission estimates compared with the future baseline for Alternative 2 are provided in Table 4.11-6. The annual emission results show that emissions in 2012-2013 would be lower under Alternative 2 than under the future baseline because of an anticipated decrease in visitor use under this alternative. The net change in annual emissions that would result from implementation of this alternative would be below the federal *de minimis* thresholds.

Emission estimates for peak daily vehicles were prepared using the EMFAC7G vehicle emission rate model. The estimated number of motor vehicles corresponds to projected traffic volumes for major holiday weekends (refer to Section 4.9). The number of OHVs is proportionate to the total visits provided in Table 4.1-1. Emission estimates for the Alternative 2 and a comparison to the Future Baseline are presented in the Table 4.11-7.

As shown in Table 4.11-7, the net peak daily emissions for Alternative 2 would be below the criteria established by ICAPCD. Therefore, no adverse air quality impact is expected to result under this alternative during major holiday weekends.



Table 4.11-5 Estimated Peak Daily Air Emissions Associated with Alternative 1

EMISSION SOURCE	EMISSIONS (POUNDS/DAY)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Halloween					
On-road Motor Vehicles	6,508.33	2,062.39	2,279.40	64.71	2,302.35
Off-highway Vehicles	13,127.60	5,177.08	776.56	110.94	12,824.52
Total	19,635.94	7,239.47	3,055.96	175.65	15,126.88
Future Baseline Total	17,072.60	6,294.41	2,657.02	152.72	13,152.17
Net Emissions	<b>2,563.34</b>	<b>945.06</b>	<b>398.94</b>	<b>22.93</b>	<b>1,974.71</b>
Thanksgiving					
On-road Motor Vehicles	11,158.45	3,535.94	3,907.99	110.95	3,947.35
Off-highway Vehicles	22,507.11	8,876.04	1,331.41	190.20	21,987.48
Total	33,665.56	12,411.99	5,239.40	301.15	25,934.83
Future Baseline Total	29,262.69	10,788.71	4,554.18	261.77	22,543.00
Net Emissions	<b>4,402.87</b>	<b>1,623.28</b>	<b>685.22</b>	<b>39.38</b>	<b>3,391.83</b>
New Year					
On-road Motor Vehicles	7,437.31	2,356.77	2,604.75	73.95	2,630.98
Off-highway Vehicles	15,001.39	5,916.04	887.41	126.77	14,655.05
Total	22,438.70	8,272.81	3,492.15	200.72	17,286.03
Future Baseline Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26
Net Emissions	<b>2,930.77</b>	<b>1,080.53</b>	<b>456.11</b>	<b>26.21</b>	<b>2,257.77</b>
Martin Luther King's Birthday					
On-road Motor Vehicles	4,650.12	1,473.55	1,628.60	46.24	1,645.00
Off-highway Vehicles	9,379.50	3,698.96	554.84	79.26	9,162.95
Total	14,029.62	5,172.51	2,183.44	125.50	10,807.95
Future Baseline Total	12,190.09	4,494.30	1,897.15	109.05	9,390.84
Net Emissions	<b>1,839.53</b>	<b>678.21</b>	<b>286.29</b>	<b>16.45</b>	<b>1,417.11</b>
President's Day					
On-road Motor Vehicles	9,300.50	2,947.19	3,257.29	92.48	3,290.09
Off-highway Vehicles	18,759.53	7,398.13	1,109.72	158.53	18,326.42
Total	28,060.03	10,345.31	4,367.01	251.01	21,616.52
Future Baseline Total	24,380.17	8,988.60	3,794.31	218.09	18,781.68
Net Emissions	<b>3,679.86</b>	<b>1,356.71</b>	<b>572.70</b>	<b>32.92</b>	<b>2,834.84</b>
Easter					



Table 4.11-5 Estimated Peak Daily Air Emissions Associated with Alternative 1

EMISSION SOURCE	EMISSIONS (POUNDS/DAY)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
On-road Motor Vehicles	7,437.31	2,356.77	2,604.75	73.95	2,630.98
Off-highway Vehicles	15,001.39	5,916.04	887.41	126.77	14,655.05
Total	22,438.70	8,272.81	3,492.15	200.72	17,286.03
Future Baseline Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26
Net Emissions	2,930.77	1,080.53	456.11	26.21	2,257.77
ICAPCD Criteria	550.00	137.00	137.00	137.00	137.00

Note: Estimated PM<sub>10</sub> emission includes both exhaust and fugitive dust emissions.

Source: CH2M HILL, 2001

Table 4.11-6 Estimated Annual Air Emissions Associated with Alternative 2

EMISSION SOURCE	EMISSIONS (TONS/YEAR)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Alternative 2					
On-road Motor Vehicles	136.11	43.13	47.67	1.35	48.15
Off-highway Vehicles	988.33	389.76	58.46	8.35	2,335.68
Alternative 2 Total (2012-2013)	1,124.43	432.89	106.13	9.71	2,383.83
Future Baseline Total (2012-2013)	1,236.39	476.00	116.70	10.67	2,621.19
Total Net Emission	- 111.96	- 43.11	- 10.57	- 0.96	- 237.36
<i>De Minimis</i> Thresholds	100.00	100.00	50.00	100.00	100.00

Note: Estimated PM<sub>10</sub> emission includes both exhaust and fugitive dust emissions.

Source: CH2M HILL, 2001

#### 4.11.2.3 Alternative 3

Annual air pollutant emission estimates compared with the future baseline are provided in Table 4.11-8. The annual emission results show that emissions in 2012-2013 would be lower under Alternative 3 than under the future baseline because of an anticipated decrease in visitor use under this alternative. This decrease in annual emissions resulting from implementation of this alternative would be less than under the Alternative 2, and would be below federal *de minimis* thresholds.

Emission estimates for peak daily vehicles were prepared using the EMFAC7G vehicle emission rate model. The estimated number of motor vehicles corresponds to projected traffic volumes for major holiday weekends (refer to Section 4.9). The number of OHVs is proportionate to the total visits provided in Table 4.1-1. Emission estimates for Alternative 3 and a comparison to the Future baseline are presented in the Table 4.11-9.

As shown in Table 4.11-9, the net peak daily emissions for the Alternative 3 would not exceed the criteria established by ICAPCD. Therefore, no adverse air quality impact is expected under this alternative during major holiday weekends. These impacts would be less than those anticipated under Alternative 2.



Table 4.11-7 Estimated Peak Daily Air Emissions Associated with the Alternative 2

EMISSION SOURCE	EMISSIONS (POUNDS/DAY)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Halloween					
On-road Motor Vehicles	4,616.60	1,462.93	1,616.86	45.90	1,633.14
Off-highway Vehicles	9,311.88	3,672.29	550.84	78.69	9,096.90
Total	13,928.48	5,135.22	2,167.70	124.60	10,730.04
Future Baseline Total	17,072.60	6,294.41	2,657.02	152.72	13,152.17
Net Emissions	<b>-3,144.12</b>	<b>-1,159.19</b>	<b>-489.32</b>	<b>-28.12</b>	<b>-2,422.13</b>
Thanksgiving					
On-road Motor Vehicles	7,912.40	2,507.32	2,771.14	78.67	2,799.05
Off-highway Vehicles	15,959.68	6,293.96	944.09	134.87	15,591.21
Total	23,872.08	8,801.28	3,715.23	213.55	18,390.26
Future Baseline Total	29,262.69	10,788.71	4,554.18	261.77	22,543.00
Net Emissions	<b>-5,390.61</b>	<b>-1,987.43</b>	<b>-838.95</b>	<b>-48.22</b>	<b>-4,152.74</b>
New Year					
On-road Motor Vehicles	5,274.24	1,671.33	1,847.18	52.44	1,865.79
Off-highway Vehicles	10,638.38	4,195.42	629.31	89.90	10,392.77
Total	15,912.62	5,866.74	2,476.49	142.34	12,258.55
Future Baseline Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26
Net Emissions	<b>-3,595.31</b>	<b>-1,325.54</b>	<b>-559.55</b>	<b>-32.17</b>	<b>-2,769.71</b>
Martin Luther King's Birthday					
On-road Motor Vehicles	3,296.07	1,044.47	1,154.37	32.77	1,166.00
Off-highway Vehicles	6,648.33	2,621.88	393.28	56.18	6,494.83
Total	9,944.40	3,666.35	1,547.66	88.96	7,660.83
Future Baseline Total	12,190.09	4,494.30	1,897.15	109.05	9,390.84
Net Emissions	<b>-2,245.69</b>	<b>-827.95</b>	<b>-349.49</b>	<b>-20.09</b>	<b>-1,730.01</b>
President's Day					
On-road Motor Vehicles	6,594.50	2,089.70	2,309.57	65.57	2,332.83
Off-highway Vehicles	13,301.41	5,245.63	786.84	112.41	12,994.31
Total	19,895.91	7,335.32	3,096.42	177.98	15,327.15
Future Baseline Total	24,380.17	8,988.60	3,794.31	218.09	18,781.68
Net Emissions	<b>-4,484.26</b>	<b>-1,653.28</b>	<b>-697.89</b>	<b>-40.11</b>	<b>-3,454.53</b>
Easter					
On-road Motor Vehicles	5,274.24	1,671.33	1,847.18	52.44	1,865.79
Off-highway Vehicles	10,638.38	4,195.42	629.31	89.90	10,392.77
Total	15,912.62	5,866.74	2,476.49	142.34	12,258.55



Table 4.11-7 Estimated Peak Daily Air Emissions Associated with the Alternative 2

EMISSION SOURCE	EMISSIONS (POUNDS/DAY)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Future Baseline Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26
Net Emissions	-3,595.31	-1,325.54	-559.55	-32.17	-2,769.71
ICAPCD Criteria	550.00	137.00	137.00	137.00	137.00

Note: Estimated PM<sub>10</sub> emission includes both exhaust and fugitive dust emissions.

Source: CH2M HILL, 2002

Table 4.11-8 Estimated Annual Air Emissions Associated with Alternative 3

EMISSION SOURCE	EMISSIONS (TONS/YEAR)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Alternative 3					
On-road Motor Vehicles	123.72	39.20	43.33	1.23	43.77
Off-highway Vehicles	898.37	354.29	53.14	7.59	2,123.09
Alternative 3 Total (2012-2013)	1,022.09	393.49	96.47	8.82	2,166.86
Future Baseline Total (2012-2013)	1,236.39	476.00	116.70	10.67	2,621.19
Total Net Emission	-214.30	-82.51	-20.23	-1.85	-454.33
<i>De Minimis</i> Thresholds	100.00	100.00	50.00	100.00	100.00

Note: Estimated PM<sub>10</sub> emission includes both exhaust and fugitive dust emissions.

Source: CH2M HILL, 2002

#### 4.11.2.4 Alternative 4

Annual air pollutant emission estimates for the Alternative 4 are provided in Table 4.11-10, along with a comparison to the future baseline. Because annual attendance at the ISDRA is not anticipated to change under this alternative, the annual emission results show that emissions in 2012-2013 would be the same as under the Future baseline. Therefore, the total net emission associated with this alternative would be zero, and would not exceed the federal *de minimis* thresholds.

Emission estimates for peak daily vehicles were prepared using the EMFAC7G vehicle emission rate model. The estimated number of motor vehicles corresponds to projected traffic volumes for major holiday weekends (refer to Section 4.9). The number of OHVs is proportionate to the total visits provided in Table 4.1-1. Emission estimates for Alternative 4 and a comparison to the Future baseline are presented in the Table 4.11-11.

As shown in Table 4.11-11, the net peak daily emissions for Alternative 4 would result in the same regional emissions impacts as the Future baseline. Therefore, the estimated net emissions would be zero, and would not exceed the ICAPCD daily emission threshold limits. The air quality impacts would be somewhat less than those anticipated under Alternative 1, and greater than those under the Alternatives 2 and 3.



Table 4.11-9 Estimated Peak Daily Air Emissions Associated with Alternative 3

EMISSION SOURCE	EMISSIONS (POUNDS/DAY)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Halloween					
On-road Motor Vehicles	4,677.10	1,482.10	1,638.05	46.51	1,654.54
Off-highway Vehicles	9,433.91	3,720.42	558.06	79.72	9,216.11
Total	14,111.01	5,202.52	2,196.11	126.23	10,870.65
Future Baseline Total	17,072.60	6,294.41	2,657.02	152.72	13,152.17
Net Emissions	<b>-2,961.59</b>	<b>-1,091.89</b>	<b>-460.91</b>	<b>-26.49</b>	<b>-2,281.52</b>
Thanksgiving					
On-road Motor Vehicles	8,016.12	2,540.19	2,807.46	79.71	2,835.74
Off-highway Vehicles	16,168.88	6,376.46	956.47	136.64	15,795.58
Total	24,185.00	8,916.64	3,763.93	216.34	18,631.32
Future Baseline Total	29,262.69	10,788.71	4,554.18	261.77	22,543.00
Net Emissions	<b>-5,077.69</b>	<b>-1,872.07</b>	<b>-790.25</b>	<b>-45.43</b>	<b>-3,911.68</b>
New Year					
On-road Motor Vehicles	5,346.26	1,694.15	1,872.41	53.16	1,891.26
Off-highway Vehicles	10,783.65	4,252.71	637.91	91.13	10,534.69
Total	16,129.92	5,946.86	2,510.31	144.29	12,425.95
Future Baseline Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26
Net Emissions	<b>-3,378.01</b>	<b>-1,245.42</b>	<b>-525.73</b>	<b>-30.22</b>	<b>-2,602.31</b>
Martin Luther King's Birthday					
On-road Motor Vehicles	3,339.02	1,058.09	1,169.42	33.20	1,181.19
Off-highway Vehicles	6,734.96	2,656.04	398.41	56.92	6,579.47
Total	10,073.99	3,714.13	1,567.82	90.12	7,760.67
Future Baseline Total	12,190.09	4,494.30	1,897.15	109.05	9,390.84
Net Emissions	<b>-2,116.10</b>	<b>-780.17</b>	<b>-329.33</b>	<b>-18.93</b>	<b>-1,630.17</b>
President's Day					
On-road Motor Vehicles	6,681.19	2,117.17	2,339.94	66.43	2,363.50
Off-highway Vehicles	13,476.26	5,314.58	797.19	113.88	13,165.13
Total	20,157.46	7,431.75	3,137.12	180.32	15,528.64
Future Baseline Total	24,380.17	8,988.60	3,794.31	218.09	18,781.68
Net Emissions	<b>-4,222.71</b>	<b>-1,556.85</b>	<b>-657.19</b>	<b>-37.77</b>	<b>-3,253.04</b>
Easter					
On-road Motor Vehicles	5,346.26	1,694.15	1,872.41	53.16	1,891.26
Off-highway Vehicles	10,783.65	4,252.71	637.91	91.13	10,534.69
Total	16,129.92	5,946.86	2,510.31	144.29	12,425.95
Future Baseline Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26
Net Emissions	<b>-3,378.01</b>	<b>-1,245.42</b>	<b>-525.73</b>	<b>-30.22</b>	<b>-2,602.31</b>
ICAPCD Criteria	<b>550.00</b>	<b>137.00</b>	<b>137.00</b>	<b>137.00</b>	<b>137.00</b>

Note: Estimated PM<sub>10</sub> emission includes both exhaust and fugitive dust emissions.

Source: CH2M HILL, 2002



Table 4.11-10 Estimated Annual Air Emissions Associated with Alternative 4

EMISSION SOURCE	EMISSIONS (TONS/YEAR)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Alternative 4					
On-road Motor Vehicles	149.66	47.42	52.41	1.49	52.94
Off-highway Vehicles	1,086.73	428.57	64.29	9.18	2,568.24
Alternative 4 Total (2012-2013)	1,236.39	476.00	116.70	10.67	2,621.19
Future Baseline Total (2012-2013)	1,236.39	476.00	116.70	10.67	2,621.19
Total Net Emission	0.00	0.00	0.00	0.00	0.00
<i>De Minimis</i> Thresholds	100.00	100.00	50.00	100.00	100.00

Note: Estimated PM<sub>10</sub> emission includes both exhaust and fugitive dust emissions.

Source: CH2M HILL, 2002

#### 4.11.2.5 Conformity Statement

The 1990 amendments to the federal CAA require federal agencies to ensure that their actions conform to the applicable SIP. The SIP is a plan that provides for implementation, maintenance, and enforcement of the NAAQS, and it includes emission limitations and control measures. Conformity to a SIP, as defined in the CAA, means conforming to the purposes of the SIP to reduce the severity and number of violations to the NAAQS and achieve timely attainment of such standards.

Pursuant to Section 176(c) of the Clean Air Act, as amended by the 1990 amendments, and the General Conformity Rule at 40 CFR Parts 51 and 93, the air quality analysis establishes that the emissions associated with the proposed project are below the *de minimis* levels and are not regionally significant because they do not exceed 10 percent of the total emission inventory for any criteria pollutants in the SSAB. If the difference between emissions of criteria pollutants associated with Alternative 2 and those of Alternative 1 would be below specified the *de minimis* levels and Alternative 2 emissions would not be regionally significant (i.e., greater than 10 percent of the emissions budget of the Air Basin), then no further evaluation is needed for the pollutant in any year. If the net emissions would be equal to or greater than the *de minimis* levels for the pollutant in any year, a formal Conformity Determination is required for that pollutant. For example, if Alternative 1 becomes the preferred action, then the net emissions under Alternative 1 would exceed *de minimis* levels for CO, NO<sub>x</sub> and PM<sub>10</sub>. Implementation of Alternative 1 may adversely impact the attainment of the SIP.

Implementation of the Alternatives 2, 3, and 4 would not adversely affect the attainment of the SIP. Consequently, Alternative 2 for these alternatives is exempt from the conformity determination requirement of the General Conformity Rule.



Table 4.11-11 Estimated Peak Daily Air Emissions Associated with Alternative 4

EMISSION SOURCE	EMISSIONS (POUNDS/DAY)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Halloween					
On-road Motor Vehicles	5,658.71	1,793.16	1,981.84	56.27	2,001.80
Off-highway Vehicles	11,413.89	4,501.25	675.19	96.46	11,150.37
Total	17,072.60	6,294.41	2,657.02	152.72	13,152.17
Future Baseline Total	17,072.60	6,294.41	2,657.02	152.72	13,152.17
Net Emissions	0.00	0.00	0.00	0.00	0.00
Thanksgiving					
On-road Motor Vehicles	9,699.12	3,073.50	3,396.90	96.44	3,431.11
Off-highway Vehicles	19,563.57	7,715.21	1,157.28	165.33	19,111.90
Total	29,262.69	10,788.71	4,554.18	261.77	22,543.00
Future Baseline Total	29,262.69	10,788.71	4,554.18	261.77	22,543.00
Net Emissions	0.00	0.00	0.00	0.00	0.00
New Year					
On-road Motor Vehicles	6,465.91	2,048.95	2,264.54	64.29	2,287.34
Off-highway Vehicles	13,042.03	5,143.33	771.50	110.21	12,740.92
Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26
Future Baseline Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26
Net Emissions	0.00	0.00	0.00	0.00	0.00
Martin Luther King's Birthday					
On-road Motor Vehicles	4,040.41	1,280.34	1,415.06	40.17	1,429.31
Off-highway Vehicles	8,149.68	3,213.96	482.09	68.87	7,961.53
Total	12,190.09	4,494.30	1,897.15	109.05	9,390.84
Future Baseline Total	12,190.09	4,494.30	1,897.15	109.05	9,390.84
Net Emissions	0.00	0.00	0.00	0.00	0.00
President's Day					
On-road Motor Vehicles	8,080.81	2,560.69	2,830.12	80.35	2,858.62
Off-highway Vehicles	16,299.36	6,427.92	964.19	137.74	15,923.05
Total	24,380.17	8,988.60	3,794.31	218.09	18,781.68
Future Baseline Total	24,380.17	8,988.60	3,794.31	218.09	18,781.68
Net Emissions	0.00	0.00	0.00	0.00	0.00
Easter					
On-road Motor Vehicles	6,465.91	2,048.95	2,264.54	64.29	2,287.34



Table 4.11-11 Estimated Peak Daily Air Emissions Associated with Alternative 4

EMISSION SOURCE	EMISSIONS (POUNDS/DAY)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Off-highway Vehicles	13,042.03	5,143.33	771.50	110.21	12,740.92
Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26
Future Baseline Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26
Net Emissions	0.00	0.00	0.00	0.00	0.00
ICAPCD Significance Thresholds	550.00	137.00	137.00	137.00	137.00

Note: Estimated PM<sub>10</sub> emission includes both exhaust and fugitive dust emissions.

Source: CH2M HILL, 2002

### 4.11.3 Mitigation Measures

The following measures would be implemented to reduce potential air quality impacts:

- Apply nontoxic chemical soil stabilizers, according to manufacturers' specifications, to all active staging areas (unpaved graded areas for OHV and visitors' parking).
- Pave parking lots and access roads at least 100 feet onto the site from main road or highway.
- Reduce traffic speeds on all unpaved roads to 15 mph or less.
- Suspend all operations when wind speeds (as instantaneous gusts) exceed 25 mph.
- Sweep all paved streets once a day if visible sand materials are carried to adjacent streets (recommend water sweepers with reclaimed water).
- Configure access roads and parking lots to minimize traffic interference and idle exhaust emission.
- Provide temporary traffic control during peak OHV activities to improve traffic flow (e.g., flagperson).
- Suspend all OHV operations during second-stage smog alerts. For daily forecast, to identify second-stage smog alerts, the following number should be called: 1-800-CUT-SMOG (Imperial County APCD).



## 4.12 HAZARDOUS MATERIALS

### 4.12.1 Assumptions and Assessment Guidelines

The assessment of impacts assumes implementation of those measures incorporated into the alternatives or required by regulation that avoid or reduce potential adverse impacts. This assessment evaluates the potential for the alternatives to result in hazardous materials-related impacts to the public or the environment in the vicinity of the ISDRA. An alternative would be expected to have an adverse effect if it would:

- Create a significant hazard by exposing the public to hazardous materials at levels exceeding the range of risk generally considered to be acceptable to EPA or other federal or state agencies as a result of being located on or proximate to a known hazardous materials site
- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials

### 4.12.2 Impacts

The environmental database search discussed in Section 3.12 provided the location of and information on known hazardous materials sites (e.g., underground storage tank) or activities (e.g., spills) that conceivably could cause impacts (e.g., direct, indirect, or both) to human health and the environment. From the standpoint of potential exposures to known sites of hazardous materials accidental releases or contamination, as discussed in Section 3.12, the approximate 20-mile separation of the ISDRA from known hazardous materials sites results in an exceedingly low potential for and probability of affecting public health and safety at or in the vicinity of the ISDRA. This would be true for all alternatives. As a result, specific potential adverse effects associated with these hazardous materials sources are not addressed further in this section.

The primary potential source of hazardous materials-related impacts at the ISDRA would derive from the short-term use of varying amounts/quantities of such materials, which typically would be associated with OHV- and camping-related equipment brought onsite by visitors. These amounts would be expected to vary under different alternatives, primarily due to the number of anticipated visitors. The potential hazards typically would include accidental releases of fuels, oil, and grease from camping- or OHV-related equipment or from accidents involving the use of flammable materials for cooking. None of these activities likely would involve a release greater than *de-minimis* conditions. *De-minimis* conditions are those "...that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate government agencies" (Holland and Knight LLP, 2001).

The small quantities of fuel, oil, and grease that may be released from OHV or cooking equipment have low relative toxicity and concentrations, and will be biodegradable. Equipment fueling will be performed away from water bodies to prevent contamination of water in the event of a fuel spill. In the event of a



fire or injury, the local fire department will be called. In conclusion, due to the small quantities of hazardous materials that are handled by visitors to the park, the potential for environmental effects from the use of these is small.

The following subsections briefly address the potential impacts of such hazardous materials use scenarios by alternative.

#### **4.12.2.1**

##### **Alternative 1**

Alternative 1 is anticipated to have the highest level of future visitation among all of the alternatives (see Table 4.1-1). Assuming that the probability for accidental spill of fuels, oils and grease is proportionate to attendance, Alternative 1 would have the highest potential impact among the alternatives. Mitigation measures provided below in Section 4.12.3 would reduce the potential for such impacts.

#### **4.12.2.2**

##### **Alternative 2**

Future visitation under Alternative 2 is anticipated to be less than under Alternatives 1 and 4, and greater than Alternative 3 (see Table 4.1-1). Therefore, under this alternative, the potential for accidental spills involving fuels, oil, and grease would be greater than Alternative 3 and less than Alternatives 1 and 4. Measures provided below under Section 4.12.3 would mitigate the potential for impacts related to accidental spills.

#### **4.12.2.3**

##### **Alternative 3**

Under Alternative 3, future visitation is anticipated to be lower than all other alternatives (see Table 4.1-1). Therefore, the potential for accidental spills involving fuels, oil, and grease would be lower under Alternative 3 than under Alternatives 1, 2, and 4. Mitigation measures described below under Section 4.12.3 would reduce the potential for impacts related to accidental spills that may occur under this alternative.

#### **4.12.2.4**

##### **Alternative 4**

Future visitation under this alternative is anticipated to be higher than under Alternatives 2 and 3, and lower than Alternative 1 (see Table 4.1-1). The probability of accidental spills of fuels, oil, and grease is expected to be directly proportionate to visitation. Therefore, the potential impact under Alternative 4 is greater than Alternatives 2 and 3, and less than Alternative 1. Mitigation measures provided below under Section 4.12.3 would reduce the potential for impacts related to accidental spills.

#### **4.12.3**

##### **Mitigation Measures**

Alternatives that result in increased visitation at the ISDRA above baseline conditions have the potential to increase the risk of impacts due to spills, leaks, releases, and improper dumping and disposal. Although this impact is not anticipated to be significant, the BLM would provide education materials relating to the storage and use of hazardous materials related to OHV recreational use. Examples include educational materials and/or kiosks for the storage, handling and disposal of hazardous materials in accordance with manufacturers' directions.



## 4.13 GEOLOGY AND SOILS

This section evaluates the potential impacts of Alternatives 1, 2, 3, and 4 on the geology and soils, as well as energy and mineral resources of the Plan Area. Assessment methods are presented for soil and geologic conditions, seismicity, and energy and mineral resources. Impacts due to seismicity and related to energy and mineral resources are also discussed.

### 4.13.1 Assumptions and Assessment Guidelines

#### Soil and Geologic Conditions

An impact resulting from implementation of an alternative would be considered adverse if it does not meet the applicable criteria set forth by regulation, as defined in Title 23, CCR, Division 3, Chapter 15, Title 14, CCR, Division 7, and 40 CFR Part 258, Subpart B (Location Restrictions), or if an impact would expose people or workers in the Plan Area to major geologic hazards. This would include the presence of geologic conditions such as unstable or compressible soils and liquefaction that would contribute to the destruction or severe damage (e.g., destabilization) of structures during a geologic event and could endanger the lives of persons in the Plan Area. In addition, impacts would result if implementation of the alternative would affect the continued enjoyment, study, or interpretation of a unique geologic feature, either by degrading or limiting access to the feature.

The geologic effect of OHVs on ISDRA has been discussed by Norris (1995), and is characterized primarily by increased erosion and the creation of vehicle tracks. Vehicle erosion impacts on mobile sand dunes can be repaired naturally in a few years if no further vehicle activities occur in the impacted area. Unvegetated or sparsely vegetated dunes are for the most part active, dynamic systems that will fairly promptly re-establish their pristine form if left relatively undisturbed and if the sources of sand are not adversely affected in some way. Relict or vegetated dunes would take longer to recover their original character than mobile, active dunes. Better-developed soils and stable surfaces within the Buffer Zone Management Area, particularly those of the distal portions of the alluvial fans extending into the Plan Area from the east, would take even longer to regain their natural aspect. In these areas of more stable surfaces, soil compaction would also be an effect of OHV activities. Evidence would suggest that some of these gravelly, stable surfaces may not regain their predisturbance character for centuries (Steiger and Webb, 2000). In this light, it is important to note that impact analyses for this DEIS refer to a baseline that is the current condition of the ISDRA, and current conditions include the plentiful vehicle tracks on these desert surfaces in most areas, with the exception of the North Algodones Dunes Wilderness Area and the Mammoth Management Area. These tracks are part of the current surface geologic conditions of the Recreation Area.

#### Energy and Mineral Resources

An alternative would have an adverse impact on leasable or locatable mineral resources if the loss of existing mineral resources could not be offset by



domestic reserves. Impacts to mineral resources would be considered adverse if the alternative would affect the existing or potential future economic production of a mineral resource, either by limiting access to the resource or by degrading the quality of the resource. It would also be an adverse effect if implementation of the alternative would eliminate access to a potential mineral resource that has been determined by a regulating agency to be rare, unique, or regionally significant.

### **Seismic Hazards**

The Plan Area lies within a seismically active area. A seismic hazard in the vicinity of the Plan Area would be considered adverse if, as a result of the occurrence of the maximum probable earthquake event, structures (i.e., bridges or buildings) built within the ISDRA were to fail causing potential injury and property damage. When state and federal regulations conflict, the more stringent regulation will be used to establish impact significance. Severe seismic hazards would include the presence of an active fault onsite or the presence of other geologic conditions that would directly or indirectly endanger the lives of persons in the Plan Area.

## **4.13.2 Impacts**

### **4.13.2.1 Alternative 1**

### **Geology and Soils**

The same conditions that applied immediately prior to instituting the temporary closures would apply under Alternative 1, the No Action Alternative. A larger area of the ISDRA would be open to OHV activity, and use intensity would be greater than under Alternatives 2 and 3. However, under the No Action Alternative, use intensity and amount of area open to motorized recreational activities would be less than under Alternative 4. Therefore, erosional impacts resulting from OHV activities would be greater for Alternative 1 than under Alternatives 2 and 3 and less than under Alternative 4. The area available for OHV use under Alternative 1 would be comparable to the existing conditions, and the impact would be commensurate; therefore, adverse impacts are not anticipated. Implementation of this alternative would not substantially alter the potential for erosional damage and soil compaction that exists under existing conditions.

### **Energy Resources**

Under Alternative 1, access to portions of the Glamis and Dunes KGRAs would not be limited, creating the potential for conflict between OHV use and geothermal development. However, implementation of this alternative would not substantially alter the potential for conflict that currently applies under existing conditions. Therefore, no adverse impact would result from implementation of Alternative 1.

### **Mineral Resources**

Mining claims and sand and gravel operations will be limited to the Glamis Management Area. However, implementation of this alternative would not substantially alter the potential for mineral operations that exists under existing conditions. Therefore, no adverse impact would result.



### **Seismic Hazards**

In seismically active regions, the potential exists for seismic damage to existing facilities and structures. Under the No Action Alternative construction of facilities and structures could occur in the future.

Consequently, the potential for seismic damage to current and future facilities does exist. Accordingly, any structures will be built according to construction codes of practice for structures in the State of California in seismically active regions.

Implementation of this alternative would not substantially alter the potential for seismic impact that exists under existing conditions, as mitigated. Therefore, no adverse impact would result.

### **Geology and Soils**

#### **4.13.2.2**

#### **Alternative 2**

This alternative would open a larger portion of the Plan Area to OHV use than under Alternative 3, and approximately the same area would be opened to OHV use as under Alternatives 1 and 4. However, the intensity of use allowed in those areas opened to OHV recreational activities would be lower than Alternative 4, and higher than Alternative 3. Therefore, the erosional impacts and soils compaction would be greater than under Alternative 3 and less than under Alternatives 1 and 4. The area available for OHV use would be less than existing conditions, and the intensity of use would be more constrained. Therefore, adverse impacts are not anticipated. Implementation of this alternative would not substantially alter the potential for damage that exists under existing conditions; therefore, no adverse impact would result.

### **Energy Resources**

Under the action alternatives, lease arrangements for energy and mineral resources could be limited or eliminated to eliminate potential conflicting uses of portions of the Plan Area. Access to the portions of the Glamis and Dunes KGRAs within the Plan Area is not limited, creating a potential for conflict between OHV use and geothermal development. However, implementation of this alternative would not substantially alter the potential for conflict under existing conditions. Therefore, no adverse impact would result.

### **Mineral Resources**

Mining claims and sand and gravel operations will be limited to the Glamis Management Area. However, implementation of this alternative would not substantially alter the potential for mineral operations that exists under interim management conditions. Therefore, no adverse impact would result.

### **Seismic Hazards**

In seismically active regions, the potential exists for seismic damage to existing facilities and structures. Construction of future facilities and structures is proposed under this alternative; consequently, the potential for seismic damage to current and future construction exists. To ensure public safety, any structures or facilities built will be constructed according to standard construction codes of practice for structures in the State of California in seismically active regions. Implementation of this alternative would not



substantially alter the potential for seismic impact that exists under current conditions, as mitigated; therefore, no adverse impact would result.

#### **4.13.2.3 Alternative 3**

##### **Geology and Soils**

This alternative would open a smaller area of the ISDRA to OHV use and would limit the intensity of that use more than under Alternatives 1, 2, or 4. Therefore, the impact resulting from OHV activities, erosion and soil compaction, would be less under this alternative than under any of the other alternatives. Because the impacted area and intensity of use would be less than existing conditions, significant adverse impacts are not anticipated. Implementation of this alternative would decrease the potential for damage due to erosion and soil compaction under existing conditions. Therefore, no adverse impact would result.

##### **Energy Resources**

Under this alternative, as with all the action alternatives, lease arrangements for energy and mineral resources could be limited or eliminated to minimize the potential of conflicting uses of the Plan Area. Access to portions of the Glamis and Dunes KGRAs would not be limited, resulting in the potential for conflict between OHV use and geothermal development. However, implementation of this alternative would not substantially alter the potential for conflict that exists under baseline conditions. Therefore, no adverse impact would result.

##### **Mineral Resources**

Mining claims and sand and gravel operations will be limited in the Glamis Management Area. However, implementation of this alternative would not substantially alter the potential for mineral operations that exists under existing conditions. Therefore, no adverse impact would result.

##### **Seismic Hazards**

In seismically active regions, the potential exists for seismic damage to existing facilities and structures. Construction of future facilities and structures are proposed under this alternative; consequently, the potential for seismic damage to current and future construction exists. To ensure public safety, any structures or facilities built will be constructed according to standard construction codes of practice for structures in the State of California in seismically active regions. Implementation of this alternative would not substantially alter the potential for seismic impact that exists under existing conditions, as mitigated; therefore, no adverse impact would result.

#### **4.13.2.4 Alternative 4**

##### **Geology and Soils**

This alternative would open a larger portion of the Plan Area to OHV use than under Alternative 3, and approximately the same area as under Alternatives 1 and 2. However, the intensity of use as would be allowed by the ROS classes would be greater under Alternative 4 than under any of the other alternatives, including the No Action Alternative. Therefore, impacts to soils and erosion would be greater than under any of the other alternatives. The area available for OHV use would be as great as under existing conditions, and the impacts



would be greater due to a higher level of use allowed in the open areas. Therefore, adverse impacts are anticipated under Alternative 4.

### Energy Resources

As with the other alternatives, portions of the Glamis and Dunes KGRAs would not be protected, creating the potential for conflict between OHV use and geothermal development. However, implementation of this alternative would not substantially alter the current potential for conflict under existing conditions. Therefore, no adverse impact to energy resources would result.

### Mineral Resources

Mining claims and sand and gravel operations will be limited in the Glamis Management Area. However, implementation of this alternative would not substantially alter the potential for mineral operations that exists under existing conditions; therefore, no adverse impact would result.

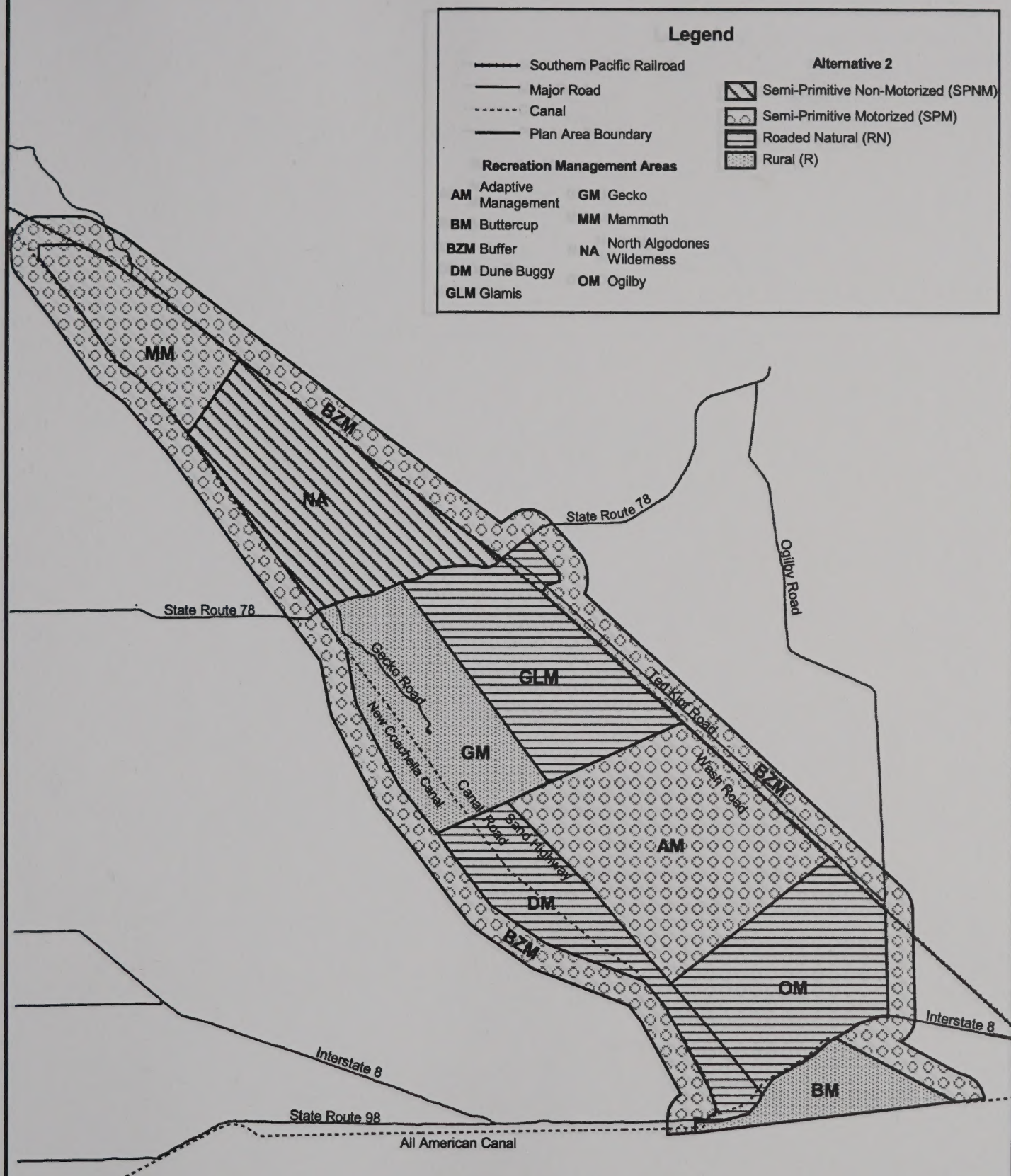
### Seismic Hazards

In seismically active regions, the potential exists for seismic damage to existing facilities and structures. Construction of future facilities and structures are proposed under this alternative; consequently, the potential for seismic damage to current and future construction exists. To ensure public safety, any structures or facilities built will be constructed according to standard construction codes of practice for structures in the State of California in seismically active regions. Implementation of this alternative would not substantially alter the potential for seismic impact that exists under existing conditions, as mitigated; therefore, no adverse impact would result.

## 4.13.3 Mitigation Measures

Mitigation measures that are applied to all alternatives, including the No Action Alternative, address earthquake hazards in this seismically active region. To ensure public safety, any facilities built will be constructed according to construction codes of practice for structures in the State of California in seismically active regions.





**Figure 4.1-1**  
**Alternative 2**

**Recreation Opportunity Spectrum Class by Management Area**  
**Imperial Sand Dunes Recreation Area - DEIS**

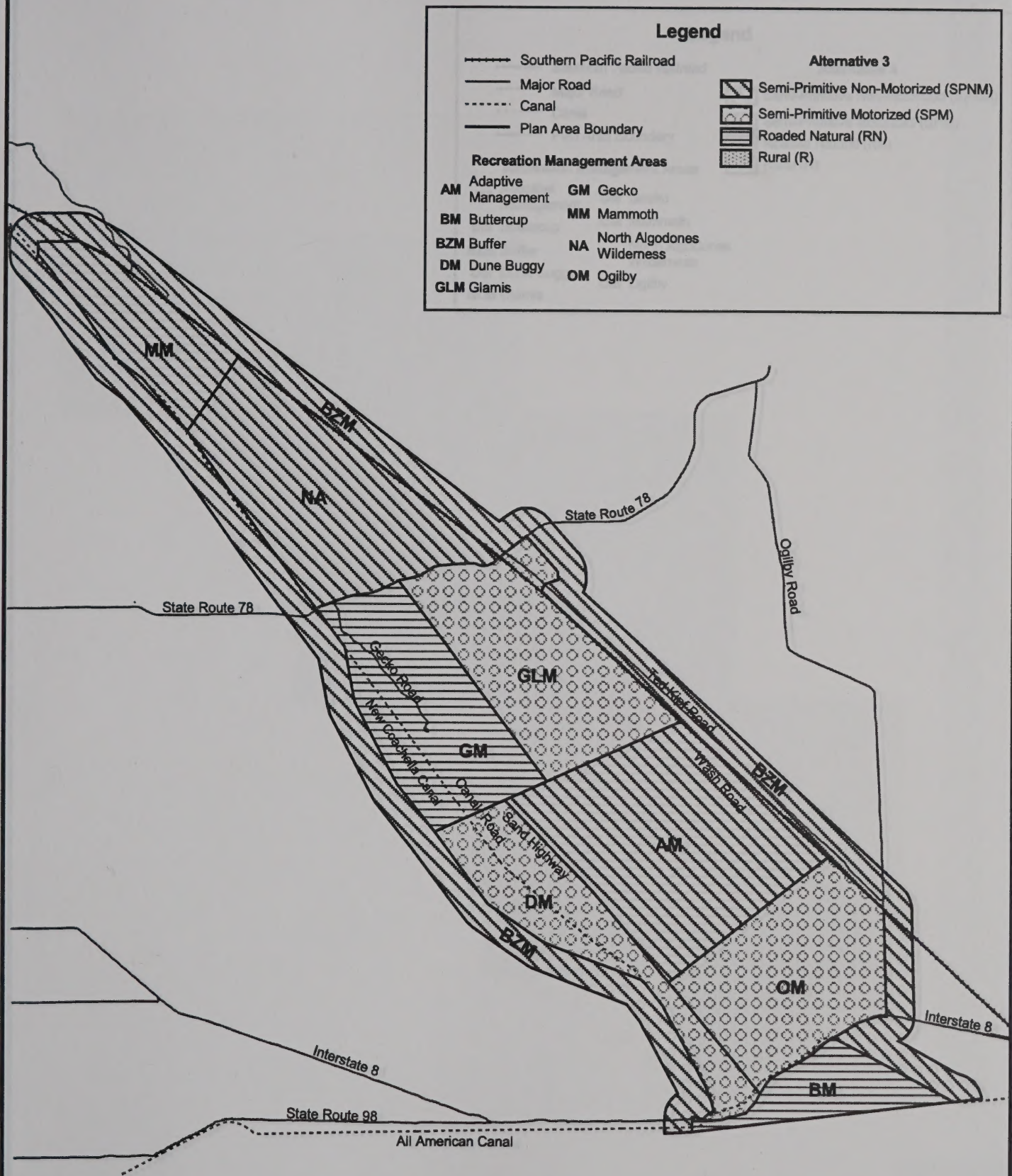
0 2 4 6 Miles











**Figure 4.1-2**  
**Alternative 3**

**Recreation Opportunity Spectrum Class by Management Area**  
**Imperial Sand Dunes Recreation Area - DEIS**

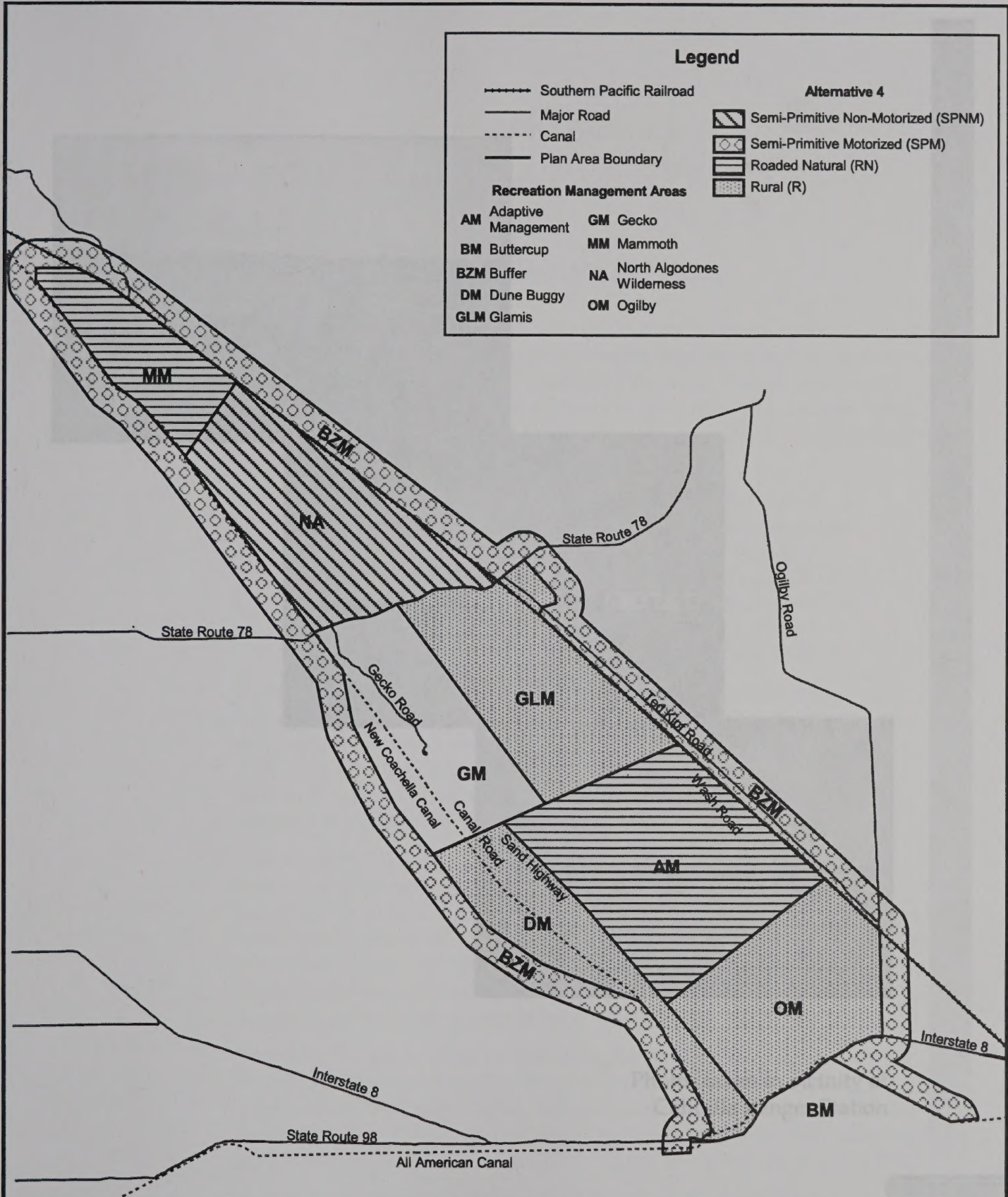


0 2 4 6 Miles









0 2 4 6 Miles









Photos taken in vicinity of  
Cahuilla Ranger Station



## Chapter 5 Cumulative Impacts



## Cumulative Impacts

### Chapter 5



Photo taken in vicinity of  
Columbia River Station

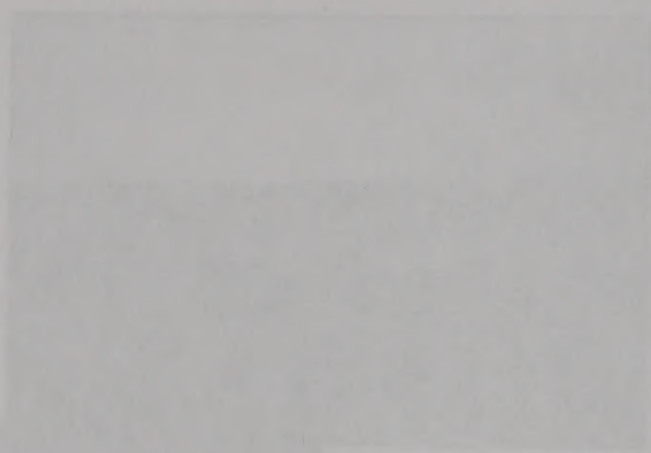
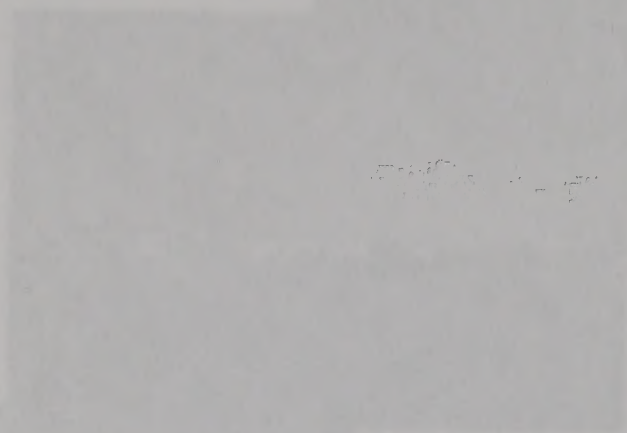
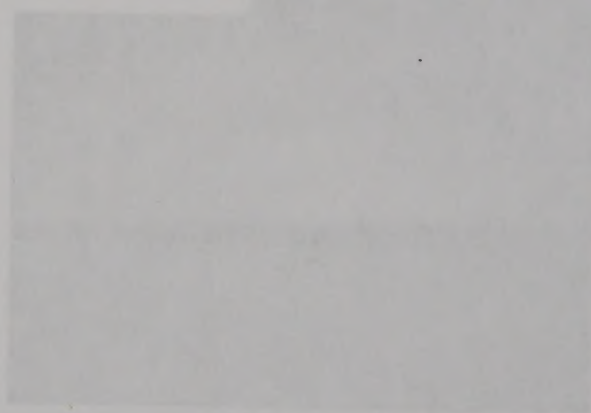


Photo taken in vicinity of  
Columbia River Station



## CHAPTER 5.0

# CUMULATIVE EFFECTS

### 5.1 INTRODUCTION

This section addresses potential cumulative impacts to the environment associated with implementation of the project alternatives in concert with one or more other past, present, and reasonably foreseeable future actions and projects. This section was prepared in accordance with NEPA requirements. The Council on Environmental Quality's (CEQ) regulations for implementing NEPA define a "cumulative impact" as follows:

*Cumulative impact is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR §1508.7).*

Cumulative effects are the total effects on a given resource or ecosystem of all actions taken. Individual effects from similar or disparate activities may add up or interact to cause cumulative effects that are not apparent when evaluating effects individually. Therefore, effects contributed by actions unrelated to the proposed action must be included in the analysis of cumulative effects (CEQ, 1997).

Actions and projects assessed for their potential to result in cumulative impacts were identified by contacting agencies in the desert Southwest, including the BLM and Imperial County Planning Department, to determine which past, present, and reasonably foreseeable actions were either similar to the actions proposed by the project alternatives or could affect the same resources as the project alternatives presented in this DEIS. The type, geographic scope, and impacts of each project were considered.

Section 5.2 describes projects considered in this cumulative impact analysis that affect OHV use of the California desert and immediately adjacent areas. The environmental review status and anticipated impacts of each project that could contribute to a cumulative impact are discussed. In addition, Section 5.2 also describes the potential cumulative impacts of projects by resource area.

Section 5.3 describes the projects considered in this cumulative impact analysis that are different from the project alternatives, but might nonetheless result in cumulative effects. The environmental review status and anticipated impacts of each project that could contribute to a cumulative impact are



discussed. Section 5.3 also describes potential cumulative impacts by resource area.

## **5.2 POTENTIAL CUMULATIVE IMPACTS FROM SIMILAR ACTIONS AND PROJECTS**

This section describes other actions and projects that are similar in type and geographic location to the project alternatives which could, if implemented in conjunction with any of the project alternatives, result in individually minor but collectively significant actions over a period of time. A description of the similar projects assessed for cumulative impacts, the potential environmental impacts that relate to the impacts of the project alternatives, and the status of the environmental review process for each project are included below.

### **5.2.1 Northern and Eastern Colorado Desert Coordinated Management Plan**

NECO is intended to protect and conserve natural resources, providing in particular for the recovery of the desert tortoise, while simultaneously balancing human uses of the Colorado portion of the Sonoran Desert ecosystem. The planning area for NECO comprises more than 5.5 million acres and is bordered along the southwest by the ISDRA. The land affected includes the northern and eastern Colorado Desert and the eastern half of Joshua Tree National Park.

BLM is the lead agency for plan development, with cooperation from NPS, the US Marine Corps (USMC), USGS, USFWS, CDFG, Imperial County, and Riverside County. The management plan would become a binding plan for BLM, NPS, and the CMAGR. BLM released a DEIS for the draft NECO Plan and alternatives in February 2001.

Implementation of NECO would amend the CDCA Plan and would result in beneficial impacts to biological resources in the desert Southwest. Depending on the alternative selected, NECO could result in reduced motorized vehicle access within its planning area, as well as the closing of some desert washes in the western part of Riverside County and two small OHV areas. Few people currently visit the OHV areas proposed to be closed (Ford Dry Lake, which is 1,134 acres, and Rice Valley Dunes, which is 2,790 acres) (Crowe, 2002).

### **5.2.2 West Mojave Habitat Conservation Plan**

The purpose of the West Mojave Habitat Conservation Plan (West Mojave Plan) is to conserve and protect the desert tortoise and nearly 100 other sensitive plants and animals, as well as the ecosystems on which they depend. The 9.4 million-acre planning area encompasses most of California's western Mojave Desert. It extends from Olancho in Inyo County on the north to the San Gabriel and San Bernardino Mountains on the south, and from the Antelope Valley on the west to the Mojave National Preserve on the east. About one third of the planning area is private land, approximately one third is within military reservations, and the remainder consists of public lands managed by BLM.



BLM is the lead agency for preparation of a DEIS for the draft West Mojave Plan. The DEIS is anticipated to be released in mid-2003.

Implementation of the West Mojave Plan would result in beneficial impacts to biological resources in the western Mojave Desert. Depending on the alternative selected, the West Mojave Plan could result in reduced motorized vehicle access within its planning area and increased management of existing OHV areas (Pilmer, 2002).

### **5.2.3 Northern and Eastern Mojave Planning Effort**

The draft Northern and Eastern Mojave Plan (NEMO Plan) includes management actions to protect threatened, endangered, and sensitive species and habitats on federal lands administered by the BLM in the eastern Mojave Desert. The NEMO Plan will amend the CDCA Plan. The NEMO Plan area encompasses about 2.4 million acres of public lands in eastern San Bernardino and Inyo Counties of California.

BLM is the lead agency for preparation of a DEIS for the draft NEMO Plan and consequent CDCA Plan Amendments, which was released to the public in April 2001. The DEIS analyzes potential impacts from the implementation of the proposed MUCs for the lands released from wilderness consideration by enactment of the CDPA, route designation in some areas, a proposed strategy to accomplish route designation in the remainder of the planning area, and proposed MUC changes to eliminate landfills on public lands.

Implementation of the NEMO Plan would result in beneficial impacts to biological resources in the NEMO planning area. Depending on the alternative selected, the NEMO Plan could result in reduced motorized vehicle access within its planning area and increased management of existing OHV areas (BLM, 2002). The NEMO Plan, however, does not propose increased management of Dumont Dunes, which offers a similar Semi-Primitive motorized OHV experience as the ISDRA (although Dumont Dunes is significantly smaller than the ISDRA) (Aarons, 2002). Dumont Dunes is located approximately 30 miles north of Baker on SR-127, off Dumont Dunes Road. It is approximately 275 miles northeast of the ISDRA.

### **5.2.4 Cumulative Impacts to Affected Resource Areas**

This section discusses the potential cumulative impacts to specific environmental resources. If the project alternatives would not result in an incremental impact to a particular resource, or if the projects described above do not have impacts in common with the project alternatives, no adverse cumulative impact would occur to that resource.

#### **5.2.4.1 Recreation Resources**

The management actions proposed under the project alternatives are intended to reduce conflicts among ISDRA user groups and preserve natural and cultural resources. As stated in Section 4.1 of this DEIS (Recreation Resources), implementation of the project alternatives will change the available acreage in the ISDRA for OHV use and the allowable intensity of such use. The intensity of the indirect effects of OHV-use limitations varies by alternative and includes: (1) increase in OHV-user demand for a unique Semi-Primitive Motorized experience; and (2) increase in OHV-user demand



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for public lands that are accessible to motorized vehicles. These indirect effects could result in the increased use of other dune areas in the desert Southwest, thereby potentially affecting the existing ROS classifications in these areas.

All of the management plans listed above will limit OHV use of dune areas as well as motorized vehicular access to public lands to a greater or lesser extent, depending on the alternative selected under each plan. Such restrictions are consistent with an apparent trend over the last several decades to limit motorized recreation in ways that would minimize the potential for damage to natural and cultural resource values and decrease the incidence of law enforcement violations. None of these plans, however, propose to restrict access to dune areas of similar quality and size as the ISDRA. Therefore, no cumulative impact would result from an increase in OHV-user demand for a unique, Semi-Primitive Motorized experience.

Implementation of the project alternatives and the management plans would not concurrently affect OHV-accessible dune areas of the same quality or size as the ISDRA. The proposed limitations on motorized recreation, (especially Alternative 3), concurrently with the limitations planned under the management plans, would increase demand of OHV opportunities on public lands and the potential for overcrowding at other OHV-accessible public areas across the desert Southwest.

### **5.2.4.2 Biological Resources**

Implementation of all of the management plans would result in beneficial impacts to biological resources throughout the CDCA. An important focus of the plans is the management and conservation of the desert tortoise. While tortoises are present in the Plan Area, the dune habitats are generally unsuitable for tortoises. However, this is the only sensitive biological resource that the Plan Area has in common with other management plans

### **5.2.4.3 Law Enforcement and Public Safety**

Implementation of the project alternatives would decrease the incidence of law enforcement violations and increase the level of public safety within ISDRA. Although to a lesser extent, the management plans would create a similar, beneficial impact. Therefore, no adverse cumulative impacts to law enforcement and public safety would occur.

### **5.2.4.4 Socio- economics**

Implementation of the project alternatives would result in a reduction in the number of visitors (and visitor spending) at the ISDRA, thereby adversely affecting the regional economy in the CDCA. If the habitat management plans were implemented, the regional economy in the CDCA would also be adversely affected because these plans would further decrease the number of visitors to the CDCA.

### **5.2.4.5 Land Use and Land Ownership**

For the most part, the project alternatives would be consistent with applicable land use plans and policies and would not result in incompatible land uses. (Only Alternatives 3 and 4 would be inconsistent with the CDCA Plan; however, mitigation measures and management actions incorporated into the all of the action alternatives would avoid adverse land use compatibility impacts.)



Although final environmental documentation for the management plans has not been released to the public at this time, it is anticipated that the management plans would be consistent with applicable land use plans and policies and would not result in incompatible land uses. Therefore, because the management plans do not have land use impacts in common with the project alternatives, cumulative land use impacts would occur.

#### **5.2.4.6 Visual Resources**

The project alternatives and the habitat management plans would not adversely affect visual resources. Therefore, no cumulative visual resources impacts would occur in the CDCA.

#### **5.2.4.7 Water Resources**

The project alternatives and the habitat management plans would not adversely affect water resources in the CDCA. Therefore, no cumulative water resources impacts would occur.

#### **5.2.4.8 Cultural and Paleontological Resources**

Ground disturbing activities associated with the project alternatives could result in potential impacts to cultural and paleontological resources. Impacts will vary based on the anticipated area of disturbance of the project alternatives. Under the 1997 BLM NPA and State Protocol Agreement (see Section 3.8 and 4.8, Cultural Resources), BLM will meet NHPA requirements for addressing effects to historic properties.

The habitat management plans also have the potential to impact cultural resources in the CDCA as a result of proposed activities, such as constructing right-of-ways and tortoise fencing along major highways. However, it is anticipated that the management plans would implement avoidance strategies during construction and operation phases to prevent significant impacts. Therefore, no cumulative impacts to cultural resources are expected to occur.

#### **5.2.4.9 Transportation and Traffic**

None of the habitat management plans would result in transportation or traffic-related impacts. Therefore, no cumulative transportation or traffic-related impacts would occur.

#### **5.2.4.10 Noise**

Implementation of the project alternatives would result in negligible, if any, elevated noise levels at sensitive receptor locations due to attenuation over distance. Similarly, the habitat management plans would result in extremely minimal noise impacts and are located far enough from each other and from the ISDRA that additive noise impacts to sensitive receptors are not anticipated. No cumulative impacts would occur.

#### **5.2.4.11 Air Quality**

Under Alternative 1, increase in visitors and recreational OHV use of the ISDRA are predicted to continue to occur until constrained by the capacity of the area to handle recreational activities. Substantial increases in air pollutant emissions are estimated to occur under this project alternative and the air quality criteria established by ICAPCD would be exceeded during major holiday weekends. Implementation of Alternative 4 would also add pollutants to the SSAB, especially CO, NO<sub>x</sub>, ROG, and PM<sub>10</sub>, from increased OHV use.

With respect to PM<sub>10</sub>, there is a potential for a number of projects located in the same air basin to generate excessive fugitive dust, resulting in visual and



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health hazards. The principal source of fugitive dust during recreational activities is entrained dust from vehicles over unpaved surfaces. Fugitive dust would also be generated on a short-term basis during construction activities. Such emissions potentially could occur concurrently with the generation of similar pollutants during implementation of the any of the project alternatives (although to a lesser extent under Alternatives 2 and 3) in conjunction with the habitat management plans. Any additional construction and recreational OHV activities occurring in the vicinity of ISDRA would increase the PM<sub>10</sub> emissions beyond already significant levels. However, it is anticipated that the development projects will include strategies to avoid and/or minimize air quality impacts during construction activities. Therefore, no cumulative air quality impacts are expected to occur.

### **5.2.4.12 Hazardous Materials**

Potential hazardous materials impacts are related to accidental releases of fuels, oil, and grease from camping and OHV-related activities. None of the other projects considered in the cumulative impacts analysis involve increased camping or OHV uses; therefore, no cumulative hazardous materials-related impacts would occur.

### **5.2.4.13 Geology and Soils**

The project alternatives and the habitat management plans would not adversely affect geology or soils, or result in geologic hazards in the CDCA. Therefore, no cumulative geology and soils-related impacts would occur.

## **5.3 CUMULATIVE IMPACTS FROM OTHER ACTIONS AND PROJECTS**

Analyzing cumulative effects requires focusing on the resource, ecosystem, and human community that may be affected and developing an adequate understanding of how these resources are susceptible to effects (CEQ, 1997). This section describes disparate actions and projects, which could, if implemented in conjunction with any of the project alternatives, result in individually minor but collectively significant actions over a period of time. A description of the projects assessed for cumulative impacts, the potential environmental impacts that relate to the impacts of the project alternatives, and the status of the environmental review process for each project are included in the discussion. Cumulative effects by resource area are also discussed at the end of the section.

### **5.3.1 Gateway of the Americas Specific Plan Area**

The Gateway of the Americas Specific Plan Area (Gateway) is a 1,775-acre master-planned industrial and commercial complex owned by private parties and federal, state, and local agencies. Retail shopping, business offices, and lodging would be developed in response to the traffic from the Port of Entry. Secondary impacts from the Gateway project include short-term air quality impacts in the SSAB as a result of construction activities associated with the development of industrial, commercial, and transportation-related services.

Imperial County prepared the Final EIR for the Gateway Specific Plan in 1997 (Imperial County Planning Department, 1997). The project is in various stages



of development in the initial construction phase (Phase 1). Phase 2 is expected to continue for 20 to 40 years (IID and BOR, 2002).

### **5.3.2 North Baja Pipeline**

North Baja Pipeline, LLC proposes to build and operate a new natural-gas pipeline system that would transport 500 million cubic feet per day of natural gas from a proposed interconnect with an existing El Paso Natural Gas Company pipeline in Ehrenberg, Arizona, to the U.S. and Mexico border. The North Baja Pipeline Project includes construction of roughly 80 miles of pipe, a compressor station, two new meter stations, and other ancillary facilities.

Secondary impacts from the North Baja Pipeline project include short-term air quality impacts in the SSAB as a result of construction activities. The Federal Energy Regulatory Commission (FERC), the CSLC, and the BLM jointly prepared a DEIS/EIR for the proposed project in July 2001. A Final EIS/EIR is anticipated to be released in the summer of 2002. It is anticipated that the Final EIS/EIR, once completed, will include mitigation measures to reduce and/or avoid air quality impacts.

### **5.3.3 Coachella Valley Water Management Plan**

The Coachella Valley Water District (CVWD) prepared the Coachella Valley Water Management Plan to provide an overall program for managing its surface and groundwater resources in the future (CVWD, 2000).

Implementation of the Water Management Plan would involve construction of various facilities for treatment of water and development of additional policies to implement increased conservation. The potential environmental impacts of the Water Management Plan have not been fully assessed at this time, but short-term air quality impacts in the SSAB as a result of construction activities are anticipated.

The draft CVWD Water Management EIR is being prepared by CVWD. A Notice of Preparation (NOP) was originally filed with the State Clearinghouse in November 1995. A revised NOP was issued in March 2000. The Draft CVWD Water Management EIR is planned for release in 2002. It is anticipated that the Draft EIR, once completed, will include mitigation measures to reduce and/or avoid air quality impacts.

### **5.3.4 IID Water Conservation and Transfer Project and HCP**

The Imperial Irrigation District (IID) Water Conservation and Transfer Project and Habitat Conservation Plan (Water Conservation and Transfer Project and HCP) consists of the conservation by IID of up to 300,000 acre-feet of Colorado River water per year, and the subsequent transfer of all or a portion of the conserved water to San Diego County Water Authority (SDCWA), CVWD, and/or the Metropolitan Water District of Southern California (Metropolitan). The water conservation program includes the voluntary participation of Imperial Valley landowners and tenants to implement on-farm conservation methods that could include alternative water management techniques, water delivery system alternatives, conveyance facility lining, or other measures.

IID and BOR are the lead agencies for the preparation of a Draft EIR/EIS for the IID Water Conservation and Transfer Project and HCP, which was



released to the public in January 2002. A final EIR/EIS is anticipated to be completed in June 2002.

As a result of the water conservation program, implementation of the Water Conservation and Transfer Project is anticipated to result in short-term and long-term impacts to air quality in the SSAB. The Draft EIR/EIS includes mitigation measures to reduce and/or avoid air quality impacts from construction activities in the Imperial Valley. However, other indirect air quality impacts in the SSAB are considered significant and unavoidable. Biological resources impacts to desert species, such as the flat-tailed horned lizard, Peirson's milk-vetch, and desert tortoise also would occur. However, the proposed HCP covers incidental take of these species through avoidance strategies and mitigation measures. In addition, depending on the alternative selected, the project could result in adverse socioeconomic impacts in Imperial County. Mitigation measures to avoid such impacts are anticipated to be implemented if the alternative that would result in adverse socioeconomic impacts were selected as the preferred alternative.

### **5.3.5 Salton Sea Restoration Project**

The Salton Sea Restoration Project includes actions to stabilize the elevation and reduce the salinity of the Salton Sea, pursuant to the Salton Sea Reclamation Act of 1998 [Public Law (PL) 105-372]. To implement this directive, the Salton Sea Authority, as the California lead agency under CEQA, and BOR, as the federal lead agency under NEPA, released a Draft EIS/EIR in January 2000 that evaluated proposed Salton Sea Restoration Project alternatives. A revised Draft EIS/EIR, including different alternatives and revised modeling and impact analysis, is currently being prepared.

Although environmental documentation has not been completed on the Salton Sea Restoration Project, it is anticipated that short-term air quality impacts in the SSAB would occur as a result of construction activities associated with project implementation. It is also anticipated that the Draft EIS/EIR, once completed, will include mitigation measures to reduce and/or avoid air quality impacts.

### **5.3.6 Coachella Canal Lining Project**

This project involves the lining of the remaining 33.4 miles of the Coachella Canal, which currently loses approximately 32,350 acre-feet per year through seepage. This canal lining project will adversely affect biological resources by loss of riparian and wetland habitat in Salt Creek and adjacent to the canal, which are supported by canal leakage. Affected desert species include the desert tortoise. The canal lining project will also have short-term air quality impacts in the SSAB associated with construction within the right-of-way of the Coachella Canal.

A revised and updated Draft EIS/EIR for the Coachella Canal Lining Project was circulated for public review by Reclamation and CVWD in September 2000. A Final EIS/EIR was released in April 2001, which was certified by CVWD in May 2001. A ROD is pending. The EIR/EIS includes mitigation measures to avoid and/or compensate for air quality and biological resources impacts.



### 5.3.7 All American Canal Lining Project

This project involves lining the 23-mile reach of the existing, unlined canal. The canal lining project will have temporary air quality impacts in the SSAB associated with construction within the proposed right-of-way of the All American Canal. Temporary and permanent impacts to desert scrub and sand dune habitat would result from construction activities. Special-status species known to inhabit or likely to inhabit these desert habitats are flat-tailed horned lizard, Colorado Desert fringe-toed lizard, giant Spanish needles, Peirson's milk-vetch, Wiggin's croton, sand food, and Andrew's dune scarab beetle.

A Final EIS/EIR for the All American Canal Lining Project was released in March 1994. The All American Canal Lining Project EIR/EIS includes mitigation measures to avoid and/or compensate for air quality and biological resources-related impacts to riparian and marsh vegetation, fish in the canal, desert habitat, and special-status species associated with desert habitats.

### 5.3.8 Future Growth and Development

As Southern California's population continues to grow (over the next 25 years, another 6 million people are expected to be added to Southern California region), municipal, industrial, commercial, and recreational development projects will be permitted and constructed. Local, regional, and state processes are in place to manage and accommodate planned growth, including General Plans, zoning regulations, and the HCP and CEQA processes, to ensure that sensitive natural and human communities are protected. However, it is expected that even with growth plans in place, additional long term impacts to air quality and sensitive habitats will occur over time.

### 5.3.9 Cumulative Impacts to Affected Resource Areas

This section discusses the cumulative impacts to specific environmental resources. If the project alternatives would not result in an incremental impact to a particular resource, or if the projects described above do not have impacts in common with the project alternatives, no adverse cumulative impact to that resource would occur.

#### 5.3.9.1 Recreation Resources

The management actions proposed under the project alternatives are intended to reduce conflicts among ISDRA user groups as well as focus on the preservation of natural and cultural resources. As stated in Section 4.1 of this DEIS, Recreation Resources, implementation of the project alternatives will change the available acreage in the ISDRA for OHV use and the allowable intensity of such use. The indirect effects of OHV-use limitations vary in intensity by alternative and include: (1) increase in OHV-user demand for a unique Semi-Primitive Motorized experience; and (2) increase in OHV-user demand for public lands that are accessible to motorized vehicles. These indirect effects could result in the increased use of other dune areas in the desert Southwest, thereby potentially affecting the existing ROS classifications in these areas.

Implementation of the projects listed in Section 5.3 are not likely to adversely affect recreation resources in the same manner as the project alternatives. Specifically, miscellaneous development projects could increase demand for other recreation opportunities and overcrowd remaining areas. Because the



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proposed alternatives would affect the different recreational uses, no recreation-related cumulative impacts would occur.

### **5.3.9.2 Biological Resources**

Some projects listed in Section 5.3 would affect some biological resources in ways similar to the proposed alternatives. These resources include desert habitats supporting desert tortoise, flat-tailed horned lizard, Colorado Desert fringe-toed lizard, giant Spanish needles, Peirson's milk-vetch, Wiggins' croton, sand food, and Andrew's dune scarab beetle. Given the committed mitigation for these projects, and relatively small area of impact, negligible adverse cumulative impacts to biological resources would occur. With regard to the miscellaneous development projects, several habitat conservation plans across the desert Southwest are being developed to protect sensitive species, including plans in San Diego, Coachella Valley, Imperial Valley, and the Colorado River watershed. Therefore, cumulative impacts to desert species would not in conjunction with implementation of the project alternatives.

### **5.3.9.3 Law Enforcement and Public Safety**

Neither the project alternatives nor the projects listed in Section 5.3 would adversely affect law enforcement nor public safety. Therefore, no adverse cumulative impacts would occur.

### **5.3.9.4 Socio- economics**

Implementation of the project alternatives would reduce the number of visitors (and visitor spending) at the ISDRA, thereby adversely affecting the regional economy in the CDCA. With the exception of the IID Water Conservation and Transfer Project and HCP, none of the projects listed in Section 5.3 would adversely impact the regional economy. Mitigation measures to avoid socioeconomic impacts are anticipated to be implemented by IID to avoid adverse socioeconomic impacts as a result of the IID Water Conservation and Transfer Project and HCP. Future development would likely result in beneficial socioeconomic impacts. No adverse, cumulative socioeconomic impacts would occur.

### **5.3.9.5 Land Use and Land Ownership**

For the most part, the project alternatives would be consistent with applicable land use plans and policies and would not result in incompatible land uses. (Only Alternatives 3 and 4 would be inconsistent with the CDCA Plan; however, mitigation measures and management actions incorporated into the all of the action alternatives would avoid adverse land use impacts in terms of land use compatibility issues.)

Although environmental documentation for all of the projects listed in Section 5.3 has not been finalized, it is anticipated that the projects would either: (1) be consistent with applicable land use plans and policies and would not result in incompatible land uses; or (2) implement measures to avoid actions that result in incompatible land uses. Therefore, because the management plans do not have land use impacts in common with the project alternatives, cumulative land use impacts would not occur.

### **5.3.9.6 Visual Resources**

Implementation of the project alternatives would not adversely affect visual resources. No cumulative visual resources impacts would occur.



**5.3.9.7 Water Resources**

Implementation of the project alternatives would not adversely affect water resources. Therefore, no cumulative water resources impacts would occur.

**5.3.9.8 Cultural and Paleontological Resources**

Despite a number of studies having been conducted, most of the ISDRA has not been inventoried for cultural resources. However, given the known cultural resources present in the ISDRA, all project alternatives have the potential to affect resources that may qualify for the CRHR and NRHP. Impacts will vary based on the anticipated area of disturbance of a project alternative. Under the 1997 BLM NPA and State Protocol Agreement (see Section 3.8 and 4.8, Cultural Resources), BLM will meet NHPA requirements for addressing effects to historic properties.

Implementation of the projects listed in Section 5.3 could result in impacts to cultural resources although it is anticipated that each project would implement avoidance strategies during construction and operation phases to prevent significant impacts. Therefore, no cumulative impacts to cultural resources are expected to occur.

**5.3.9.9 Transportation and Traffic**

Implementation of the project alternatives would result in short-term traffic impacts. However, such impacts would be localized and, therefore, would not result in cumulative transportation or traffic-related impacts in conjunction with implementation of the projects listed in Section 5.3.

**5.3.9.10 Noise**

Implementation of the project alternatives would not significantly impact sensitive receptors due to attenuation over distance. Similarly, the projects listed in Section 5.3 would result in short-term, construction-related noise impacts; however, they are located far enough from each other and from the ISDRA that additive noise impacts to sensitive receptors are not anticipated. No cumulative impacts would occur.

**5.3.9.11 Air Quality**

Under Alternative 1, increase in visitors and recreational OHV use of the ISDRA are predicted to continue to occur until constrained by the capacity of the area to handle recreational activities. Substantial increases in air pollutant emissions are estimated to occur under this project alternative, and the air quality criteria established by ICAPCD would be exceeded during major holiday weekends. Implementation of Alternative 4 would also add pollutants to the SSAB, especially CO, NO<sub>x</sub>, ROG, and PM<sub>10</sub>, from increased OHV use.

With respect to PM<sub>10</sub>, there is a potential for a number of projects located in the same air basin to generate excessive fugitive dust, resulting in visual and health hazards. The principal source of fugitive dust during recreational activities is entrained dust from vehicles over unpaved surfaces. Fugitive dust would also be generated on a short-term basis during construction activities. Such emissions could potentially occur concurrently with the generation of similar pollutants during implementation of any of the project alternatives (although to a lesser extent under Alternatives 2 and 3) in conjunction with the projects listed in Section 5.3. Any additional construction and recreational OHV activities occurring in the vicinity of ISDRA would increase the PM<sub>10</sub> emissions beyond already significant levels. However, it is anticipated that the



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development projects will include strategies to avoid and/or minimize air quality impacts during construction activities. Therefore, no cumulative air quality impacts are expected to occur.

### 5.3.9.12 Hazardous Materials

Potential hazardous materials impacts are related to accidental releases of fuels, oil, and grease from camping and OHV-related activities. None of the other projects considered in the cumulative impacts analysis involve increased camping or OHV uses; therefore, no cumulative hazardous materials-related impacts would occur.

### 5.3.9.13 Geology and Soils

The project alternatives would not adversely affect geology or soils, or result in geologic hazards. Therefore, no contribution to cumulative geology and soils-related impacts would occur.



## CHAPTER 6.0

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1990-1991		
Project Name	Project Number	Project Status
Project A	101	Completed
Project B	102	In Progress
Project C	103	On Hold
Project D	104	Completed
Project E	105	In Progress
Project F	106	On Hold
Project G	107	Completed
Project H	108	In Progress
Project I	109	On Hold
Project J	110	Completed
Project K	111	In Progress
Project L	112	On Hold
Project M	113	Completed
Project N	114	In Progress
Project O	115	On Hold
Project P	116	Completed
Project Q	117	In Progress
Project R	118	On Hold
Project S	119	Completed
Project T	120	In Progress
Project U	121	On Hold
Project V	122	Completed
Project W	123	In Progress
Project X	124	On Hold
Project Y	125	Completed
Project Z	126	In Progress
Project AA	127	On Hold
Project AB	128	Completed
Project AC	129	In Progress
Project AD	130	On Hold
Project AE	131	Completed
Project AF	132	In Progress
Project AG	133	On Hold
Project AH	134	Completed
Project AI	135	In Progress
Project AJ	136	On Hold
Project AK	137	Completed
Project AL	138	In Progress
Project AM	139	On Hold
Project AN	140	Completed
Project AO	141	In Progress
Project AP	142	On Hold
Project AQ	143	Completed
Project AR	144	In Progress
Project AS	145	On Hold
Project AT	146	Completed
Project AU	147	In Progress
Project AV	148	On Hold
Project AW	149	Completed
Project AX	150	In Progress
Project AY	151	On Hold
Project AZ	152	Completed
Project BA	153	In Progress
Project BB	154	On Hold
Project BC	155	Completed
Project BD	156	In Progress
Project BE	157	On Hold
Project BF	158	Completed
Project BG	159	In Progress
Project BH	160	On Hold
Project BI	161	Completed
Project BJ	162	In Progress
Project BK	163	On Hold
Project BL	164	Completed
Project BM	165	In Progress
Project BN	166	On Hold
Project BO	167	Completed
Project BP	168	In Progress
Project BQ	169	On Hold
Project BR	170	Completed
Project BS	171	In Progress
Project BT	172	On Hold
Project BU	173	Completed
Project BV	174	In Progress
Project BV	175	On Hold
Project BW	176	Completed
Project BX	177	In Progress
Project BY	178	On Hold
Project BZ	179	Completed
Project CA	180	In Progress
Project CB	181	On Hold
Project CC	182	Completed
Project CD	183	In Progress
Project CE	184	On Hold
Project CF	185	Completed
Project CG	186	In Progress
Project CH	187	On Hold
Project CI	188	Completed
Project CJ	189	In Progress
Project CK	190	On Hold
Project CL	191	Completed
Project CM	192	In Progress
Project CN	193	On Hold
Project CO	194	Completed
Project CP	195	In Progress
Project CQ	196	On Hold
Project CR	197	Completed
Project CS	198	In Progress
Project CT	199	On Hold
Project CU	200	Completed
Project CV	201	In Progress
Project CV	202	On Hold
Project CW	203	Completed
Project CX	204	In Progress
Project CY	205	On Hold
Project CZ	206	Completed
Project DA	207	In Progress
Project DB	208	On Hold
Project DC	209	Completed
Project DD	210	In Progress
Project DE	211	On Hold
Project DF	212	Completed
Project DG	213	In Progress
Project DH	214	On Hold
Project DI	215	Completed
Project DJ	216	In Progress
Project DK	217	On Hold
Project DL	218	Completed
Project DM	219	In Progress
Project DN	220	On Hold
Project DO	221	Completed
Project DP	222	In Progress
Project DQ	223	On Hold
Project DR	224	Completed
Project DS	225	In Progress
Project DT	226	On Hold
Project DU	227	Completed
Project DV	228	In Progress
Project DV	229	On Hold
Project DW	230	Completed
Project DX	231	In Progress
Project DY	232	On Hold
Project DZ	233	Completed
Project EA	234	In Progress
Project EB	235	On Hold
Project EC	236	Completed
Project ED	237	In Progress
Project EE	238	On Hold
Project EF	239	Completed
Project EG	240	In Progress
Project EH	241	On Hold
Project EI	242	Completed
Project EJ	243	In Progress
Project EK	244	On Hold
Project EL	245	Completed
Project EM	246	In Progress
Project EN	247	On Hold
Project EO	248	Completed
Project EP	249	In Progress
Project EQ	250	On Hold
Project ER	251	Completed
Project ES	252	In Progress
Project ET	253	On Hold
Project EU	254	Completed
Project EV	255	In Progress
Project EV	256	On Hold
Project EW	257	Completed
Project EX	258	In Progress
Project EY	259	On Hold
Project EZ	260	Completed
Project FA	261	In Progress
Project FB	262	On Hold
Project FC	263	Completed
Project FD	264	In Progress
Project FE	265	On Hold
Project FF	266	Completed
Project FG	267	In Progress
Project FH	268	On Hold
Project FI	269	Completed
Project FJ	270	In Progress
Project FK	271	On Hold
Project FL	272	Completed
Project FM	273	In Progress
Project FN	274	On Hold
Project FO	275	Completed
Project FP	276	In Progress
Project FQ	277	On Hold
Project FR	278	Completed
Project FS	279	In Progress
Project FT	280	On Hold
Project FU	281	Completed
Project FV	282	In Progress
Project FV	283	On Hold
Project FW	284	Completed
Project FX	285	In Progress
Project FY	286	On Hold
Project FZ	287	Completed
Project GA	288	In Progress
Project GB	289	On Hold
Project GC	290	Completed
Project GD	291	In Progress
Project GE	292	On Hold
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Project GH	295	On Hold
Project GI	296	Completed
Project GJ	297	In Progress
Project GK	298	On Hold
Project GL	299	Completed
Project GM	300	In Progress
Project GN	301	On Hold
Project GO	302	Completed
Project GP	303	In Progress
Project GQ	304	On Hold
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Project GT	307	On Hold
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Project GV	309	In Progress
Project GV	310	On Hold
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Project GX	312	In Progress
Project GY	313	On Hold
Project GZ	314	Completed
Project HA	315	In Progress
Project HB	316	On Hold
Project HC	317	Completed
Project HD	318	In Progress
Project HE	319	On Hold
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Project HG	321	In Progress
Project HH	322	On Hold
Project HI	323	Completed
Project HJ	324	In Progress
Project HK	325	On Hold
Project HL	326	Completed
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Project HN	328	On Hold
Project HO	329	Completed
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Project HQ	331	On Hold
Project HR	332	Completed
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Project HV	337	On Hold
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Project IB	343	On Hold
Project IC	344	Completed
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Project IE	346	On Hold
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Project II	350	Completed
Project IJ	351	In Progress
Project IK	352	On Hold
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Project IN	355	On Hold
Project IO	356	Completed
Project IP	357	In Progress
Project IQ	358	On Hold
Project IR	359	Completed
Project IS	360	In Progress
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Project IU	362	Completed
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Project IV	364	On Hold
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Project JB	370	On Hold
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Project KV	418	On Hold
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Project KX	420	In Progress
Project KY	421	On Hold
Project KZ	422	Completed
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Project LB	424	On Hold
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Project LE	427	On Hold
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Project LG	429	In Progress
Project LH	430	On Hold
Project LI	431	Completed
Project LJ	432	In Progress
Project LK	433	On Hold
Project LL	434	Completed
Project LM	435	In Progress
Project LN	436	On Hold
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Project LP	438	In Progress
Project LQ	439	On Hold
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Project LT	442	On Hold
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Project LV	445	On Hold
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Project LY	448	On Hold
Project LZ	449	Completed
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Project MB	451	On Hold
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Project ME	454	On Hold
Project MF	455	Completed
Project MG	456	In Progress
Project MH	457	On Hold
Project MI	458	Completed
Project MJ	459	In Progress
Project MK	460	On Hold
Project ML	461	Completed
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Project MN	463	On Hold
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Project MQ	466	On Hold
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Project MY	475	On Hold
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Project NB	478	On Hold
Project NC	479	Completed
Project ND	480	In Progress
Project NE	481	On Hold
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Project NH	484	On Hold
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Project NN	490	On Hold
Project NO	491	Completed
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Project NQ	493	On Hold
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Project NS	495	In Progress
Project NT	496	On Hold
Project NU	497	Completed
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Project NV	499	On Hold
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Project OH	511	On Hold
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Project ON	517	On Hold
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Project OP	519	In Progress
Project OQ	520	On Hold
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Project OS	522	In Progress
Project OT	523	On Hold
Project OU	524	Completed
Project OV	525	In Progress
Project OV	526	On Hold
Project OW	527	Completed
Project OX	528	In Progress
Project OY	529	On Hold
Project OZ	530	Completed
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Project PB	532	On Hold
Project PC	533	Completed
Project PD	534	In Progress
Project PE	535	On Hold
Project PF	536	Completed
Project PG	537	In Progress
Project PH	538	On Hold
Project PI	539	Completed
Project PJ	540	In Progress
Project PK	541	On Hold
Project PL	542	Completed
Project PM	543	In Progress
Project PN	544	On Hold
Project PO	545	Completed
Project PP	546	In Progress



## CHAPTER 7.0

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## CHAPTER 8.0

# GLOSSARY AND LIST OF ACRONYMS

°F	degrees Fahrenheit
AADT or ADT	Average Annual Daily Traffic volume
AASHTO	Association of American State Highway and Transportation Officers
Access Easement	Legal permission granted by the owner of a property to another entity, to enter or cross the property for specified purposes.
ACEC	Area of Critical Environmental Concern. An identified area requiring special management attention to protect important biological, geological, or cultural resources.
APCD	Air Pollution Control District
ASA	American Sand Association
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
ATV	All-terrain vehicle. A three- or four-wheeled vehicle equipped with low-pressure tires and a seat straddled by the rider.
BA	Biological Assessment
Biological Opinion	A document prepared by the USFWS and NMFS stating their collective opinion as to whether or not a federal action will likely jeopardize the continued existence or adversely modify the habitat of a listed threatened or endangered species.
BLM	Bureau of Land Management
BMP	best management practice
BO	Biological Opinion
BOR	Bureau of Reclamation
CAA	Clean Air Act



## Glossary and List of Acronyms

CAAQS	California Ambient Air Quality Standards. California Ambient Air Quality Standards established by the California Air Resources Board.
Caltrans	California Department of Transportation
Candidate Species	A plant or animal species that is undergoing status review by the USFWS to be listed as threatened or endangered.
CARB	California Air Resources Board
CCR	California Code of Regulations
CDCA	California Desert Conservation Area Plan. Completed in 1980, this Congressionally mandated document provides long-range, general guidance for management of all BLM-administered public lands in the California Desert, including the Imperial Sand Dunes.
CDFG	California Department of Fish and Game
CDPA	California Desert Protection Act
CEDD	California Economic Development Department
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive, Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act
CFGC	California Fish and Game Commission
CFR	Code of Federal Regulations
cfs	cubic feet per second
CHP	California Highway Patrol
CIWMA	California Integrated Waste Management Act
Class C (Controlled)	The most restrictive of the four Desert Plan multiple use classes, assigned only to wilderness study areas that have been preliminarily recommended as suitable for wilderness designation by Congress.



**Class I (Intensive)**

Areas where concentrated use of land and resources is intended. Includes areas set aside for intensive off-highway vehicle recreation. This class is suitable for development of facilities for intensive recreational use.

**Class L (Limited)**

Provides for low-intensity, carefully controlled use. Usually assigned to areas of particularly sensitive or important natural or cultural resources. Facilities that provide for resource protection may be constructed in this class.

**Class M (Moderate)**

Intended to provide a balance between resource protection and use. Recreation facility developments may be constructed in this class.

**CLETS**

California Law Enforcement  
Telecommunication System

**Closed Area**

An area where motorized vehicles are not allowed. Nonmotorized uses such as hiking and horseback riding are usually allowed and encouraged in Closed Areas, except in present and former military bombing ranges, which are closed to all forms of human entry. The perimeter of all Closed Areas is posted with signs to inform the public of the types of uses allowed.

**cm**

centimeter

**CMAGR**

Chocolate Mountain Aerial Gunnery Range

**CNDDDB**

California Natural Diversity Data Base. The CNDDDB is a computerized inventory of information on the general location and condition of California's rare and threatened animals, plants, and natural communities maintained by the CDFG.

**CNEL**

Community Noise Equivalent Level

**CNPPA**

California Native Plant Protection Act

**CNPS**

California Native Plant Society. CNPS is a professional society of plant biologists, scientists, and associated professionals that has accumulated a statewide database on California native plants and their distribution.



## Glossary and List of Acronyms

CO	carbon monoxide
CRHR	California Register of Historical Resources
Critical Habitat	Specific areas with physical or biological features that are imperative to the continued survival and conservation of a listed species. These areas may require special management and are generally designated in <i>Federal Register</i> notices.
CSLC	California State Lands Commission
Cultural Resources	Building, district, structure, site, or object significant in history, architecture, archaeology, culture, or science.
CVWD	Coachella Valley Water District
dB	decibel
dBA	decibel A-weighted
DEIR	Draft Environmental Impact Report
DEIS	Draft Environmental Impact Statement
DOI	Department of Interior
DOT	Department of Transportation
EA	Environmental Assessment. A document prepared to predict and evaluate the effect of an action on the natural environment and human communities.
EDD	Employment Development Department
EDR	Electronic database report
EIS	Environmental Impact Statement. A federal environmental decisionmaking report pursuant to the National Environmental Policy Act (NEPA).
EIS/EIR	Environmental Impact Statement/Environmental Impact Report
EMS	emergency medical service
EMT	Emergency Medical Technician. A person trained and state-certified to provide emergency care at the scene of an accident or illness.



**Endangered Species**

An animal or plant species that is in danger of extinction throughout all of a significant portion of its range (as defined in The Endangered Species Act Amendments of 1982). The U.S. Fish and Wildlife Service regularly use this definition. The State of California and the California Native Plant Society subscribe to a slightly different definition.

**Endemic**

Native to a certain region.

**EPA**

United States Environmental Protection Agency

**EQIP**

Environmental Quality Incentives Program

**ERNS**

Emergency Response Notification System

**ESA**

Endangered Species Act

**Eutrophication**

The process by which waters rich in mineral and organic nutrients promote a proliferation of plant life, especially algae, and reduce the dissolved oxygen content, causing the extinction of other organisms.

**Existing Setting**

Existing biological, physical, social, and economic conditions of an area to which changes are proposed, either directly or indirectly, by human actions.

**FERC**

Federal Energy Regulatory Commission

**FESA**

Federal Endangered Species Act

**FICC**

Federal Interagency Communication Center

**FINDS**

Faculty Index System

**FLPMA**

Federal Land Policy Management Act of 1976. The Congressional Act that directs BLM to manage the public lands according to the principles of multiple use and sustained yield. The California Desert Conservation Area and the development of the Desert Plan resulted from Section 601. Section 603 required the BLM to review roadless areas for potential inclusion in the National Wilderness Preservation System, and mandated interim management protection of wilderness study areas.



Gateway	Gateway of the Americas Specific Plan Area
GIS	geographic information system
GPS	global positioning system
Green Sticker Fund	A fund generated by the State of California through collection of off-highway vehicle “green sticker” registration fees, 1 percent of state gasoline taxes, and fines from violations at State Vehicular Recreation Areas. Grants from the fund are made available to federal, state, and local governmental entities to acquire, develop, operate, and maintain OHV recreation areas.
Green Sticker	Evidence of registration with the State of California Department of Motor Vehicles. All OHVs are required to display it.
GWSI	Groundwater Site Inventory
Habitat	(1) – Specific parameters of physical conditions used by a single species, a group of species, or a large community. The major components of habitat are generally considered to be food, water, cover, and living space. (2) – The natural living space of an organism.
HCM	Highway Capacity Manual
I	Interstate
ICAPCD	Imperial County Air Pollution Control District
ICO	issue, concern, and opportunity
IID	Imperial Irrigation District
ISDRA	Imperial Sand Dunes Recreation Area
KGRA	Known Geothermal Resource Area. An area in which the geology, nearby discoveries, competitive interest, or other evidence would, in the opinion of the Secretary of the Interior, convince those with experience in the field that the prospects for extraction of geothermal steam or associated geothermal resources are good enough to warrant expenditures of money for that purpose. Major portions of the



kV

Glamis KGRA and the Dunes KGRA overlap the Imperial Sand Dunes Recreation Area.

kilovolt

Lead Agency

The agency initiating and overseeing the preparation of an EIS and/or EIR.

LEO

Law enforcement officer. LEO in the BLM responsible for protecting public safety and resources within the United States' 264 million acres of BLM-managed public land.

Limited Use Area

An area in which motor vehicles are restricted to approved routes. Restrictions may vary among individual Limited Use Areas.

LORS

laws, ordinances, regulations, and standards

LOS

Level of Service existing for roadway segments.

MBTA

Migratory Bird Treaty Act

Metropolitan

Metropolitan Water District of Southern California

MOU

Memorandum of Understanding

mph

miles per hour

MUC

multiple use classification. A classification system developed as part of the Desert Plan, with guidelines describing the types of land uses and resource management techniques appropriate to each class. Most lands in the California Desert Conservation Area have been assigned to one of the four multiple use classes: Class C, L, M, or I. Small acreages, notably those proposed for sales or withdrawal to other agencies, remain unclassified.

NAAQS

National Ambient Air Quality Standards. EPA established the NAAQS to protect public health and welfare from the effects of air pollution.

NCIC

National Crime Information Center

NECO

Northern and Eastern Colorado Desert Coordinated Ecosystem Management Plan



## Glossary and List of Acronyms

NEMO	Northern and Eastern Colorado Coordinated Management Plan
NEMO Plan	Northern and Eastern Mojave Plan
NEPA	National Environmental Policy Act
NESHAPS	National Emissions Standards for Hazardous Air Pollutants. The federal and state laws and regulations define a group of pollutants called “hazardous air pollutants,” “toxic air contaminants,” or “air toxics.” These pollutants are regulated by the NESHAPS section of the federal Clean Air Act, various state laws and regulations, state air toxics acts (e.g., AB 1807, AB 2588, and SB 1731 programs), and Imperial County Air Pollution Control District (APCD) Regulations XI and XII.
NHPA	National Historical Preservation Act
NLETS	National Law Enforcement Telecommunication System
NO <sub>2</sub>	nitrogen dioxide
NOI	Notice of Intent
NOP	Notice of Preparation
NO <sub>x</sub>	oxides of nitrogen
NPA	National Programmatic Agreement
NPS	National Park Service
NRHP	National Register of Historic Places
O <sub>3</sub>	ozone
OHV Designation	Public lands designated for off-highway vehicle use. Lands in the California Desert Conservation Area are designated as “Open,” “Closed,” or “Limited” for OHV use.
OHV	Off-highway Vehicle. A general term referring to all types of vehicles capable of operating on roads that are not maintained. These include motorcycles, ATVs, dune buggies, and four-wheel-drive vehicles.



Open Area

A place in which motor vehicles may travel freely (i.e., cross-country travel is permitted).

P

Primitive. An ROS class designation that characterizes an area as an essentially unmodified natural environment of fairly large size.

Pb

Chemical notation for lead.

Plank Road

A one-lane wooden road that was the first automobile thoroughfare to cross the Imperial Sand Dunes between 1914 and 1926.

Remnants of the Plank Road are now designated as an Area of Critical Environmental Concern (ACEC).

PM<sub>10</sub>

respirable particulate matter with a diameter of less than 10 microns

PRC

Public Resources Code

R

Rural

RAMP

Recreation Area Management Plan. A plan prepared for recreation areas requiring special management.

RCRA

Resource Conservation and Recovery Act

RN

Roaded-Natural. An ROS class designation characterizing an area as a predominantly natural-appearing environment with moderate evidence of the sights and sounds of humans.

ROD

Record of Decision

ROG

reactive organic gas

ROS

Recreation Opportunity Spectrum. A land delineation system commonly used by federal land management agencies to address the need for a range of recreational opportunities within their planning areas.

Rural

(R). An ROS class designation that characterizes a natural environment that has been modified substantially by development of structures, vegetative manipulation, or pastoral agricultural development.



## Glossary and List of Acronyms

RV	Recreational Vehicle. Categorically, this term describes large, self-contained camping vehicles such as motorhomes and travel trailers.
SARA	Superfund Amendments and Reauthorization Act
SCAQMD	South Coast Air Quality Management District
SDAB	San Diego Air Basin
SDCWA	San Diego County Water Authority
Semi-Primitive Motorized	(SPM). An ROS class designation that characterizes an area as a predominantly natural or natural-appearing environment of moderate to large size. Use of local primitive or collector roads with predominantly natural surfaces and trails suitable for motorbikes is permitted.
Semi-Primitive Non-Motorized	(SPNM). An ROS class designation that characterizes an area as a predominantly natural or natural-appearing environment of moderate to large size. Motorized recreation use is not permitted.
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO <sub>2</sub>	sulfur dioxide
SO <sub>x</sub>	sulfur oxide
SPM	Semi-Primitive Motorized
SPNM	Semi-Primitive Non-Motorized
SR	State Route
SSAB	Salton Sea Air Basin
T&E species	Threatened and endangered species. This broad definition is considered when writing and implementing policy.
T/E	threatened/endangered
TCP	Traffic Control Plan



## Threatened Species

An animal or plant species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range (as defined in the Endangered Species Act Amendments of 1982). This is the definition used by the U.S. Fish and Wildlife Service. The State of California and the California Native Plant Society define the term slightly differently.

## TOA

Thomas Olsen and Associates

## TRT

technical review team

## U

Urban

## UPRR

Union Pacific Railroad

## Urban

(U). An ROS class designation characterizing an area as a substantially urbanized environment, although the background may have natural-appearing elements.

## URTD

upper respiratory tract disease

## USACE

United States Army Corps of Engineers

## USBP

United States Border Patrol

## USC

United States Code

## USFS

United States Forest Service

## USFWS

United States Fish and Wildlife Service

## USGS

United States Geological Survey

## USMC

United States Marine Corps

## UST

underground storage tank

## Visitor Supply

Maximum number of visitors that could occur at ISDRA while maintaining the designated ROS class.

## VRM Program

Visual Resource Management Program. A BLM-developed system used to evaluate the visual resources of a given area to determine what degree of protection, rehabilitation, or enhancement is desirable and possible.

## VUD

Visitor Use Day. One VUD is equal to 12 hours spent by one person in the pursuit of recreation.



WEMO

West Mojave Coordinated Management Plan

West Mojave Plan

West Mojave Habitat Conservation Plan

WHA

wildlife habitat area

Whoop-De-Do's

A series of closely spaced undulations in the surface of an off-highway vehicle trail, created by the tires of the vehicles. Whoop-de-do's make the trail difficult to use for some types of vehicle, particularly large RVs.

WIS

Wilderness Implementation Strategy

WSA

Wilderness Study Area. A roadless area of public lands that the BLM has determined possess the wilderness qualities described in the Wilderness Act of 1964. Congress established WSAs to study the suitability of areas of possible designation as wilderness.



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DEPARTMENT OF THE INTERIOR  
Bureau of Land Management

Notice of Availability of a Draft Recreation Area Management Plan for the Imperial Sand Dunes  
Recreation Area and associated Draft Amendment to the California Desert Conservation Area  
Plan and Draft Environmental Impact Statement

AGENCY: Bureau of Land Management

ACTION: Notice of Availability of a Draft Recreation Area Management Plan (DRAMP) for the  
Imperial Sand Dunes Recreation Area (ISDRA) and associated Draft Amendment to the  
California Desert Conservation Area (CDCA) Plan and Draft Environmental Impact Statement  
(DEIS)

SUMMARY: The DRAMP and Draft Amendment to the CDCA Plan provide direction and  
guidance for the management of public lands and resources of the ISDRA, including goals and  
management objectives, management prescriptions in accordance with the Federal Land Policy  
and Management Act (FLPMA) of 1976, management direction specific to discrete areas within  
the ISDRA, and monitoring and evaluation requirements. The DEIS evaluates the DRAMP and  
alternatives to the DRAMP, including necessary amendments to the CDCA Plan.

DATES: Written comments on the DRAMP, Draft Amendment to the CDCA Plan and DEIS  
will be accepted until June 28, 2002. Six (6) public meetings will be held between 7:00-10:00  
pm. The dates and locations of the public meetings are as follows:

April 9, 2002	El Centro, CA	City Council Chambers 1275 Main Street El Centro, CA
April 11, 2002	Long Beach, CA	The Grand 4101 East Willow Street Long Beach, CA
April 15, 2002	Phoenix, AZ	Phoenix College 1202 West Thomas Road Phoenix, AZ
April 18, 2002	Brawley, CA	Brawley City Council 228 A Street Brawley, CA
April 23, 2002	Yuma, AZ	Yuma Civic and Convention Center 1440 W Yuma, AZ

## APPENDIX A NOTICE OF AVAILABILITY







## DEPARTMENT OF THE INTERIOR

## Bureau of Land Management

Notice of Availability of a Draft Recreation Area Management Plan for the Imperial Sand Dunes Recreation Area and associated Draft Amendment to the California Desert Conservation Area Plan and Draft Environmental Impact Statement

AGENCY: Bureau of Land Management

ACTION: Notice of Availability of a Draft Recreation Area Management Plan (DRAMP) for the Imperial Sand Dunes Recreation Area (ISDRA) and associated Draft Amendment to the California Desert Conservation Area (CDCA) Plan and Draft Environmental Impact Statement (DEIS).

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April 23, 2002	Yuma, AZ	Yuma Civic and Convention Center 1440 W Desert Hills Drive Yuma, AZ



April 25, 2002 San Diego, CA

Marriott Mission Valley  
8757 Rio San Diego Drive  
San Diego, CA

ADDRESSES: Comments should be sent to Greg Thomsen, Field Manager, El Centro Field Office, California Desert District, Bureau of Land Management, 1661 South 4<sup>th</sup> Street, El Centro, CA 92243. Comments also may be sent by e-mail to: [rtrost@ca.blm.gov](mailto:rtrost@ca.blm.gov). Comments on the DRAMP, Draft Amendment to the CDCA Plan and DEIS, including names and addresses of respondents, will be available for public review at the El Centro Field Office during normal working hours (7:45 AM to 4:15 PM, except holidays), and may be published as part of the Final Environmental Impact Statement and Amendment to the CDCA Plan. Individuals may request confidentiality. If you wish to withhold your name or address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses will be made available for public inspection in their entirety. The planning documents and direct supporting record for the analysis and DRAMP will be available for inspection at the El Centro Field Office during normal working hours. Some important historical records may also be posted on the BLM Internet site to facilitate public access.

FOR FURTHER INFORMATION: Roxie Trost, Bureau of Land Management, 1661 South 4<sup>th</sup> Street, El Centro, CA 92243; (760) 337-4420.

SUPPLEMENTAL INFORMATION: The ISDRA project area, trending generally for 40 miles from the southeast to northwest, comprises approximately 208,284 acres of public lands bounded approximately to the west by the Old Coachella Canal, to the east by the Union Pacific Railroad, to the North by Mammoth Wash, and to the south by Interstate 8 and the California/Mexico border. The primary activities conducted in the ISDRA include recreational camping and use of Off-Highway Vehicles. Issues addressed in the DRAMP and DEIS include: recreation resources; biological resources (wildlife and botany); cultural resources and paleontology; land ownership and management; geology and soils; socioeconomics; and public health and safety. The DEIS also addresses water; noise; mineral resources; hazardous materials; solid waste; visual resources; energy; access; climate; topography; and air quality.

Greg Thomsen  
Field Manager  
El Centro Field Office



# Biological Assessment for the Imperial Sand Dunes Recreation Area

## **APPENDIX B BIOLOGICAL ASSESSMENT**







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## Biological Assessment for the Imperial Sand Dunes Recreation Area







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# 1.0 Introduction

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The purpose of this Biological Assessment (BA) is to review the Draft Imperial Sand Dunes Recreation Area Management Plan (RAMP) to determine the extent implementation of the RAMP may affect the threatened Peirson's milk-vetch (*Astragalus magdalenae* var. *peirsonii*), threatened desert tortoise (*Gopherus agassizii*), and proposed threatened flat-tailed horned lizard (*Phrynosoma mcallii*). The Bureau of Land Management (BLM) is requesting formal consultation on the Peirson's milk-vetch and desert tortoise, and a formal conference on the flat-tailed horned lizard. Because the RAMP is a planning document, this BA focuses on the effect of management actions to be implemented as a part of this planning effort. The actions addressed within this BA do not fall within critical habitat of any species protected under the Endangered Species Act (ESA).

This BA has been prepared in accordance with legal requirements set forth under Section 7 of the ESA (16 U.S.C. 1536(c)), and follows the standards established in the National Environmental Policy Act (NEPA) and ESA guidance established for the BLM. As the lead federal agency, BLM will oversee compliance with laws, ordinances, regulations, and standards (LORS) required for the project, as well as conservation and mitigation measures. The BLM has also prepared a Draft Environmental Impact Statement (DEIS) to analyze the potential environmental impacts resulting from the revision and updating of the RAMP. Detailed information and impact assessment on other special-status species at the Imperial Sand Dunes Recreation Area (ISDRA) is presented in the DEIS.

## 1.1 Purpose and Need

### 1.1.1 Purpose

The RAMP guides all resource management activities and establishes management prescriptions for the ISDRA (Figures 1-1 and 1-2). The goal of the RAMP is to provide a comprehensive and detailed management plan designed to provide a variety of sustainable OHV and other recreational activities, and to maintain or improve the conditions of the special-status species and other unique natural and cultural resources while creating an environment to promote the health and safety of visitors, employees, and nearby residents.

The RAMP establishes:

- Resource Area-wide multiple-use goals and ecosystem management objectives
- The Plan Area management prescriptions that fulfill the requirements of the Federal Land Policy and Management Act (FLPMA) of 1976
- Management area direction including management area prescriptions applying to future management activities in specific management areas
- Monitoring and evaluation requirements



The RAMP embodies the provisions of FLPMA, the implementing regulations, and other guiding documents. It is developed in accordance with the California Desert Conservation Area (CDCA) Plan of 1980 and will amend portions of the CDCA Plan pertaining to recreation management in the ISDRA. It revises and replaces the 1987 RAMP.

The RAMP will specify what levels of visitor use can be provided for motorized vehicle use in the ISDRA while maintaining the habitat requirements for special-status species, conserving cultural resources, providing reasonable consideration for other important natural resources and providing for the health and safety of visitors, nearby residents, employees, and other service providers in the ISDRA.

It will institute measures to achieve desired visitor use levels; maintain habitat requirements for special-status species; conserve cultural resources; provide reasonable consideration of other important natural resources; and provide for the health and safety of visitors, nearby residents, employees, and other service providers in the ISDRA. It will establish criteria for modifying those measures or instituting additional measures if needed in the future, based on monitoring of visitor use and the conditions and trends of special-status species, cultural resources, and important natural resources.

The RAMP will identify the type and level of visitor services, including facilities, needed to support desired visitor use. For services to be provided by BLM, the RAMP will identify cost for these services. The RAMP will establish a fee system such that the appropriate level of visitor services can be provided in an efficient, cost-effective manner.

The RAMP will identify needed adjustments to land tenure. It will identify management guidelines for use of the existing right-of-way corridor and areas with right-of-way agreements. It will establish two utility right-of-way corridors, an underground corridor along State Route (SR) -78 and a corridor along the existing railroad right-of-way. It will also confirm decisions from the CDCA Plan and current RAMP that are still valid and will not be revised by the revised RAMP.

Management area allocations, prescriptions, monitoring, and evaluation requirements constitute a statement of BLM's intended direction. However, projected outputs, services, and rates of implementation are contingent upon obtaining funding, including grants, agreements, and the annual budgeting process.

The RAMP will guide the ISDRA beginning in 2002. It will normally be revised every 10 years, but may continue to be used for up to 15 years. It may be amended or revised at any time if the Field Manager determines that conditions in the ISDRA have changed beyond those anticipated by the Plan, or if monitoring or project-level environmental analysis indicate a need for a change in management direction.

The RAMP implements the EIS Preferred Alternative (Alternative 2). It is the alternative the Field Manager has determined will most benefit the public. Careful consideration was given to coordinating and balancing various conflicting resource uses to arrive at a sustainable mix.



### 1.1.2 Need

The ISDRA offers outstanding recreational opportunities for off-highway vehicle (OHV) recreation in the California Desert District. To fulfill its management obligations under federal regulations, the BLM must carefully manage OHV use, so that the conditions of the special-status species and other unique natural and cultural resources are maintained or improved. The type and level of OHV use also must be carefully managed to create an environment that promotes the health and safety of visitors, employees, and nearby residents.

Because the previous plan was written in 1987, several of the projects identified have been implemented. Of the projects that were not implemented, many may no longer be feasible. Therefore, it is critical to revisit some of the past decisions and determine whether or not new courses should be charted.

Since the 1987 RAMP, several regulatory changes have taken place that relate to the ISDRA. The U.S. Fish and Wildlife Service (USFWS) has listed the Peirson's milk-vetch and desert tortoise as a federally threatened plant. The flat-tailed horned lizard has been proposed as federally threatened by the USFWS. The North Algodones Dunes Wilderness was designated in 1994. Wilderness Study Area (WSA) 362 has been released from further studies concerning its suitability for wilderness designation. Analyzing this new information may lead to different management decisions in the future.

The proximity of the ISDRA to private land and wilderness requires that the BLM carefully manage the recreation, natural, and cultural resources, and corresponding resource values (such as "scenic values") within the Plan Area to reduce potential impacts to nonfederal property.

Southern California's continued population growth in the urban and nonurban areas and shifting demographic patterns have increased the demand for outdoor recreation at the ISDRA and neighboring areas. Related to this, the problem of trespass in the North Algodones Dunes Wilderness and private lands (both within and adjacent to the Plan Area) has traditionally created conflicts between OHV enthusiasts, landowners, and concerned members of the public. It continues to be a management challenge to encourage appropriate recreational use, discourage inappropriate use, while respecting the freedom of visitors to enjoy the ISDRA.

In addition to discussing the positive recreational uses of the ISDRA, the RAMP discusses a variety of issues, their proposed solutions, and opportunities for creative improvement.

## 1.2 Consultation to Date

The following is a summary of meetings and correspondence that were important to the decisionmaking process.

- December 17, 1996: Conference Opinion for the Construction of the Proposed Gray's Well ( Herman Schneider Bridge) east of El Centro, California (1-6-97-F-8).
- October 14, 1999: The letter memorandum confirms Conference Opinion 1-6-97-F-8 as the Biological Opinion for the Gray's Well Bridge (Herman Schneider Bridge) Project.



- July 13, 2001: USFWS letter to BLM, concurring that the closure of 49,305 acres of Algodones Dunes to motorized vehicles is not likely to adversely affect Peirson's milk-vetch.
- October 16, 2001: BLM letter to USFWS, Carlsbad, requesting concurrence on the list of species to be addressed in the BA. Letter delivered to Sandy Vissman, USFWS.
- October 16-17, 2001: Site visit with USFWS to view habitats and discuss major issues, concern, and opportunities (ICOs), within the ISDRA project site boundary (BLM, 2001h).
- October 30, 2001: Letter initiating consultation with the USFWS on the proposed RAMP for the ISDRA.
- October 30, 2001: Meeting with USFWS to review the Thomas Olsen and Associates Monitoring Report for Peirson's milk-vetch (ISDRA RAMP Project) (TOA, 2001).
- October 31, 2001: USFWS letter to BLM concurring that the temporary camping closure on the east side of Algodones Dunes is not likely to adversely effect the desert tortoise.
- November 2, 2001: Teleconference between BLM and USFWS natural resource specialists to discuss various project alternatives in terms of sensitive resource protection.

## **1.3 Interim Closures/Temporary Camping Closure**

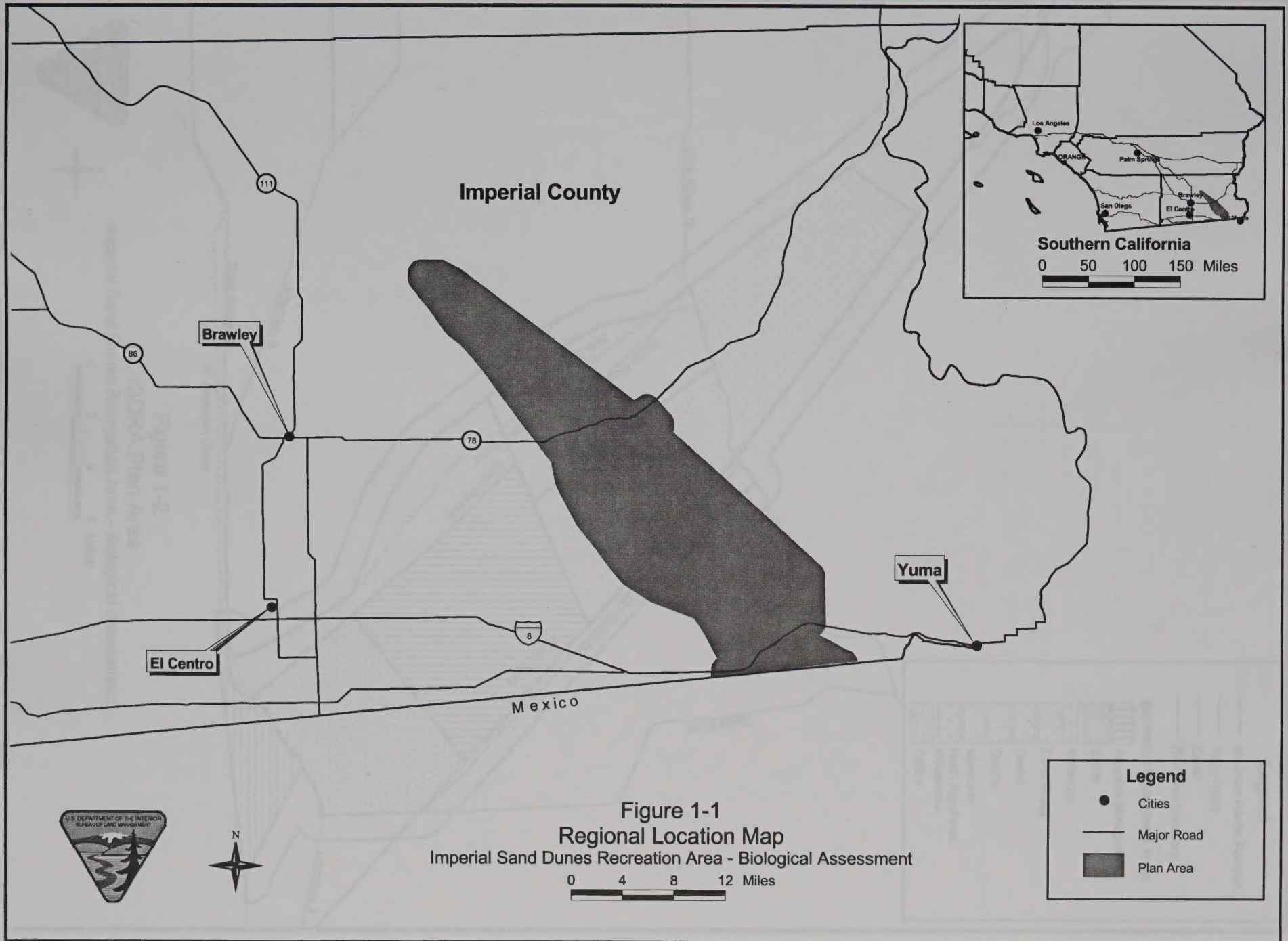
### **1.3.1 Peirson's Milk-vetch**

On November 3, 2000, a legal stipulation respecting the Peirson's milk-vetch, designated as threatened under the ESA, became effective; and five parcels in the ISDRA were closed to motorized vehicle use. The closure boundaries are identified by sign posts and identified in the Amended Stipulation and Order Concerning Injunctive Relief for the Peirson's Milk-Vetch, Case No. C-00-0927 WHA-JCS. Four closure areas were named, while the fifth parcel was unnumbered, but was described as the Patton Valley Area. These areas are delineated in Figure 1-3, and total approximately 49,000 acres.

### **1.3.2 Desert Tortoise**

On October 18, 2001, the legal stipulation respecting the desert tortoise became effective; and a temporary camping closure on approximately 25,600 acres of desert tortoise habitat within the ISDRA was approved. The camping closure is located east of Glamis and the Union Pacific Railroad (UPRR). As with other ISDRA management directions, the camping restriction does not apply to private lands within the closure area, nor does it restrict the use of motorized vehicles on existing routes of travel otherwise allowed by the CDCA Plan and 1987 RAMP.

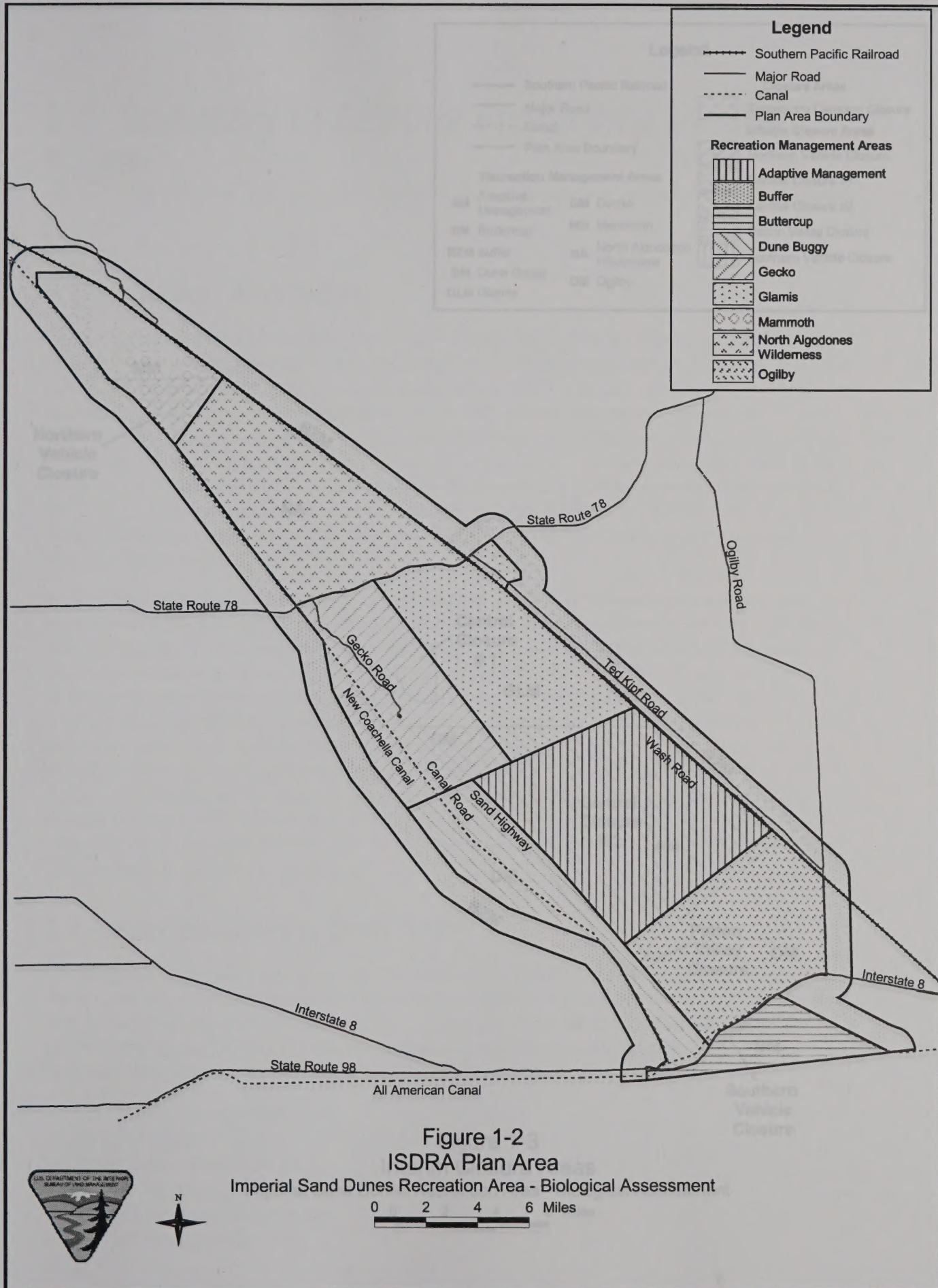








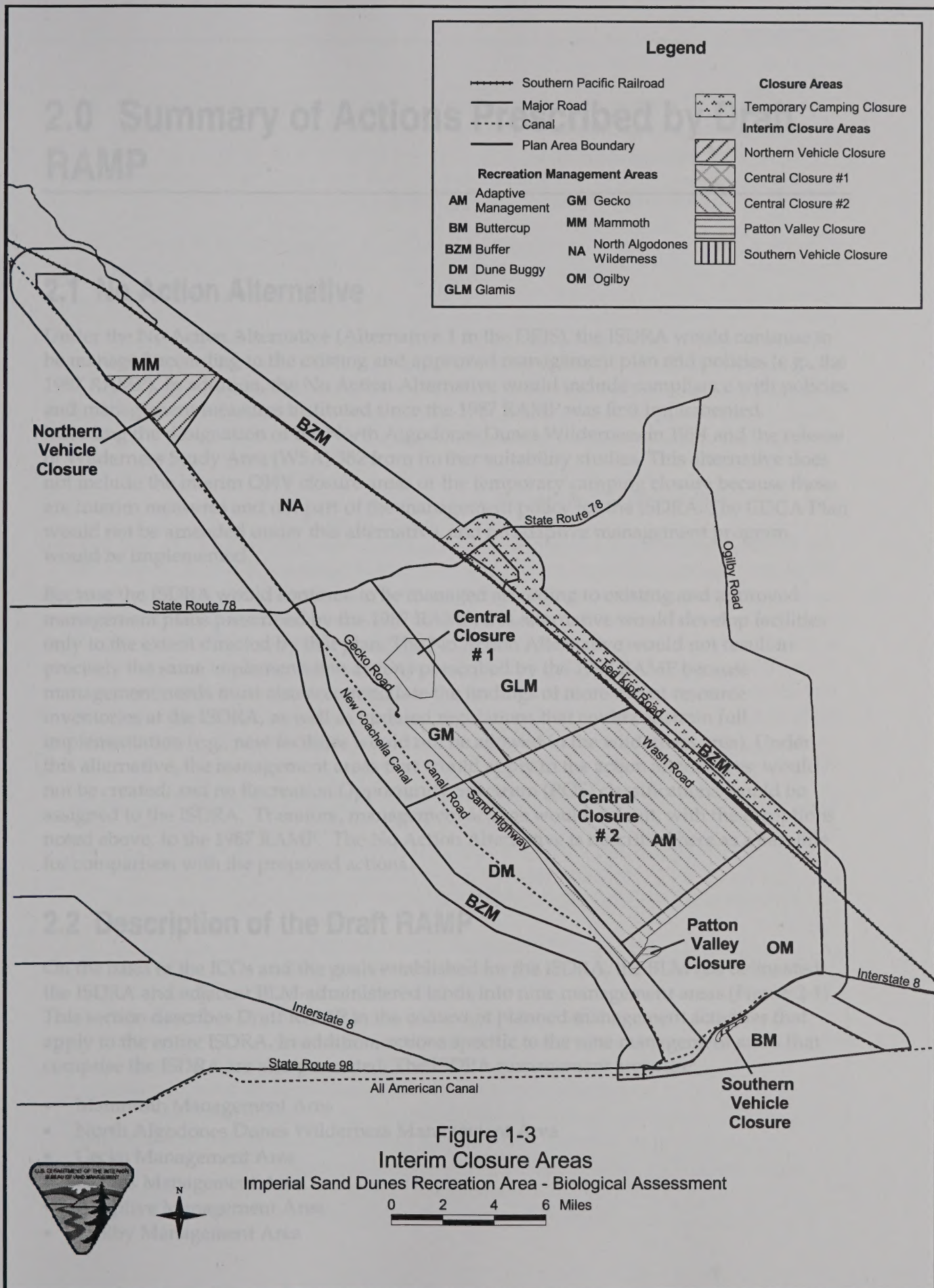


















## 2.0 Summary of Actions Prescribed by Draft RAMP

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### 2.1 No Action Alternative

Under the No Action Alternative (Alternative 1 in the DEIS), the ISDRA would continue to be managed according to the existing and approved management plan and policies (e.g., the 1987 RAMP). In addition, the No Action Alternative would include compliance with policies and management measures instituted since the 1987 RAMP was first implemented, including the designation of the North Algodones Dunes Wilderness in 1994 and the release of Wilderness Study Area (WSA) 362 from further suitability studies. This alternative does not include the interim OHV closure areas or the temporary camping closure because these are interim measures and not part of the management policy for the ISDRA. The CDCA Plan would not be amended under this alternative, and no adaptive management program would be implemented.

Because the ISDRA would continue to be managed according to existing and approved management plans prescribed by the 1987 RAMP, this alternative would develop facilities only to the extent directed by that plan. The No Action Alternative would not result in precisely the same implementation actions prescribed by the 1987 RAMP because management needs must also accommodate the findings of more recent resource inventories at the ISDRA, as well as updated regulations that could constrain full implementation (e.g., new facilities would not be allowed in the wilderness area). Under this alternative, the management areas that would apply to the action alternatives would not be created; and no Recreation Opportunity Spectrum (ROS) classifications would be assigned to the ISDRA. Therefore, management actions would default, with the exceptions noted above, to the 1987 RAMP. The No Action Alternative is described here as a baseline for comparison with the proposed actions.

### 2.2 Description of the Draft RAMP

On the basis of the ICOs and the goals established for the ISDRA, the BLM has delineated the ISDRA and adjacent BLM-administered lands into nine management areas (Figure 2-1). This section describes Draft RAMP in the context of planned management activities that apply to the entire ISDRA. In addition, actions specific to the nine management areas that comprise the ISDRA are also presented. The ISDRA management areas are:

- Mammoth Management Area
- North Algodones Dunes Wilderness Management Area
- Gecko Management Area
- Glamis Management Area
- Adaptive Management Area
- Ogilby Management Area



- Dune Buggy Flats Management Area
- Buttercup Management Area
- Buffer Zone Management Area

## 2.3 Management Areas and Actions

Presented below is a summary of the Draft RAMP as it applies to the ISDRA and, where applicable, to the specific management areas. In general, the proposed activities Resource Area-wide and in the management areas are not substantively different from current practices. The major differences between the existing condition and the Draft RAMP are the efforts to encourage a safe and enjoyable recreational experience for the user and to emphasize public education about OHV use in the context of the recreational/cultural/and biological resources of the area. Where facilities are planned and law enforcement is planned to be increased, these actions are proposed to ensure the public's health and safety in the context of an enjoyable recreational experience.

## 2.4 Management Measures

The ISDRA is located on the eastern edge of Imperial County (Figure 1-1). The area includes the largest mass of sand dunes in California and provides some of the most unique OHV recreational opportunities in the desert Southwest. The dunes are more than 40 miles in length have an average width of 5 miles. The dune system is currently divided into three areas: (1) the northern-most area is referred to as Mammoth Wash; (2) the North Algodones Dunes Wilderness, established by the 1994 California Desert Protection Act, is south of Mammoth Wash (this area is closed to mechanized use and access is by hiking and horseback); and (3) the largest and most heavily used area of the ISDRA begins at SR-78 and continues south just past Interstate (I) 8 to the Mexican Border. Under the Draft RAMP, the ISDRA would be delineated into nine management areas.

The Draft RAMP emphasizes a management approach that is based on the management goals identified above, with a specific emphasis on recreation-based management. The recreational setting is used to determine the level of development; the types of facilities that are appropriate; and, ultimately, the type of recreational opportunity that one will experience. Table 2-1 is a summary of the Draft RAMP Resource Area management activities.

<b>Table 2-1 Draft RAMP Resource Area Management Activities</b>	
Recreation	<ul style="list-style-type: none"> <li>• Maintain and manage ISDRA as a unique locale providing rural, roaded-natural, and semi-primitive OHV recreation opportunities in the desert southwest</li> <li>• Accommodate OHV enthusiasts in the ISDRA without displacing the activity into less intensively used areas within the El Centro Field Office (ECFO) management area</li> <li>• Control OHV congregation areas in a way that provides safety for the OHV enthusiast and personnel</li> <li>• Adaptively manage OHV recreation to meet ROS settings on nonholiday weekends, accommodate ROS settings changes</li> </ul>



**Table 2-1 Draft RAMP Resource Area Management Activities**

	during the six major holidays that vary from nonholiday management actions
Public Outreach	<ul style="list-style-type: none"> <li>• Develop a public relations program on safety and design and implement interpretive displays and brochures</li> <li>• Develop cultural resources education program</li> <li>• Develop relationship with OHV organizations</li> </ul>
Biological Resources	<ul style="list-style-type: none"> <li>• Implement a biological monitoring program, including adaptive management for species of concern in the ISDRA. (see Appendix 1 of RAMP)</li> </ul>
Air Quality	<ul style="list-style-type: none"> <li>• Implement dust control measures in certain areas</li> <li>• Install air meters for ozone/PM<sub>10</sub> in ISDRA</li> </ul>
Transportation/ Traffic	<ul style="list-style-type: none"> <li>• Grade roads</li> <li>• Implement fee entry and construct traffic control</li> </ul>
Public Health and Safety	<ul style="list-style-type: none"> <li>• Create a law enforcement cooperative team</li> <li>• Increase permanent staff and holiday staff</li> <li>• Ban alcohol outside camping areas</li> <li>• Establish a sundown to sunup closure at Competition Hill north and south, Oldsmobile Hill, Test Hill, and Patton Valley</li> <li>• Post speed limits (see Chapter III of Draft RAMP for locations and speeds)</li> <li>• Develop/maintain radio system</li> <li>• Continue existing condition of dispatching duties from Cahuilla Ranger Station</li> </ul>
Visitor Use	<ul style="list-style-type: none"> <li>• Conduct a three-part monitoring study: <ul style="list-style-type: none"> <li>- Data collection on types of vehicles entering the dunes, number of people in vehicles, and the types of OHV vehicles being brought to the dunes.</li> <li>- Count vehicles entering the ISDRA</li> <li>- Conduct demographic studies to obtain data on the willingness-to-pay and actual expenditure data by OHV recreation visitors under different adaptive management regimes</li> </ul> </li> <li>• If visitation exceeds the supply over 15 percent of the season, capacity will be limited to ensure ROS management objectives are met</li> <li>• If visitation exceeds supply over 20 percent of the season or 15 percent of the season for 2 consecutive years, more restrictive actions will be considered to limit access to the recreation area</li> <li>• Each management area has a visitor capacity that will be met 50 percent of the visitor season (October 1 through May 31)</li> </ul>
Land Use	<ul style="list-style-type: none"> <li>• Establish management areas with specific ROS classifications to meet planning objectives</li> </ul>



**Table 2-1 Draft RAMP Resource Area Management Activities**

Commercial	<ul style="list-style-type: none"> <li>• Vending allowed October 1 through May 31 on Friday through Sunday (exceptions made for major holidays)</li> <li>• Nonrecreational commercial activities not allowed during the holidays</li> </ul>
Access and Facilities Development	<ul style="list-style-type: none"> <li>• Develop or retrofit facilities, in the appropriate ROS classes, to accommodate visitation and meet all disability regulations and standards</li> <li>• Ensure that little or no development occurs in primitive areas</li> <li>• Construct disability compliant trash collection facilities (and loading docks)</li> </ul>
Fiscal	<ul style="list-style-type: none"> <li>• Collect fees in all areas based on demand and cost recovery</li> <li>• Review price structure every 2 years</li> <li>• Update fee business plan within 2 years of ROD</li> </ul>
Source: EIS (BLM 2002)	

## 2.5 Individual Management Areas

This section summarizes the Draft RAMP individual management areas of the ISDRA. Actions specific to these areas are noted, where applicable, when they provide greater detail than the general Resource Area actions (see Table 2-1) or when the ISDRA measures are not applicable to a management area. Greater detail on the Draft RAMP and the measures in the individual management areas is in the RAMP (Chapter III).

### 2.5.1 Mammoth Management Area and Management Measures

The proposed ROS for the Mammoth Management Area is Semi-Primitive Motorized. Under the Draft RAMP, conserving and protecting natural and cultural resources, including threatened and other sensitive plants and animals, will be emphasized. OHV recreational opportunities for small groups and other individuals that seek solitude with relatively low concentrations of OHV use will be allowed. The management focus will ensure that the semi-primitive characteristics of the area remain intact. Specific management actions that would be implemented in this area under the Draft RAMP are:

- Allow OHV recreation in accordance with the ROS
- Establish visitor use ranges to achieve low OHV use and retain semi-primitive characteristics
- Conduct recreation satisfaction survey
- Aggressive outreach program on habitat/conservation protection
- Establish environmental ethics program
- Patrol by rangers not on a regular basis
- No road improvement planned



- No commercial events except photography or filming permits
- No facilities planned or allowed

### 2.5.2 North Algodones Dunes Wilderness Management Area and Management Measures

For this management area, the Draft RAMP would not differ substantively from the existing condition because the North Algodones Dunes Wilderness Management Area would remain be maintained as a wilderness. It would be managed under the Semi-Primitive Non-Motorized ROS classification. A predominantly natural or natural-appearing environment of moderate to large size (generally larger than 2,500 acres) characterizes this setting. Currently, motorized access into this area is allowed for law enforcement activities and for the maintenance of wildlife guzzlers. Occasionally, others trespass into this area with motorized vehicles. The amount of motorized trespasses in this area should be reduced. Specific management actions that would be implemented in this area under the Draft RAMP are:

- A low visitor density would be established
- Update kiosks at watchable wildlife site
- No motorized access allowed except law enforcement and to maintain wildlife guzzlers (The amount of motorized trespasses in this area should be reduced.)

### 2.5.3 Gecko Management Area and Management Measures

The Gecko Management Area currently is the most developed management area in the ISDRA; and it includes Gecko Road, all the adjacent pads and campgrounds, and the Osborne Overlook area. The existing affected facilities include roads, campgrounds, toilets, trash stations, camping pads, overlooks, information kiosks, commercial vending, and a ranger station. In this area, facilities for intensified motorized use and camping already exist.

The Cahuilla Ranger Station, which is located adjacent to Gecko Road just south of SR-78, comprises a visitor area, medical room, break room, offices, and employee restrooms all housed in a triple-wide trailer. There are two single-wide trailers that are used as housing for the onsite emergency medical technician (EMT) and Law Enforcement Ranger. There is a storage shed for equipment and vehicles, several cargo containers, and a weather station. The entire area is fenced with a portion of the lot designated as a helipad.

Under the Draft RAMP, the Cahuilla Ranger Station would remain as the main area of operations for the BLM's entire ISDRA operations and as the designated location for visitors to seek assistance. It would be managed under the ROS Rural classification. Specific management actions that would be implemented in this area under the Draft RAMP are:

- Eliminate camping between the canals and north of SR-78
- Increase amount of camping area on Gecko Road to consolidate camping and avoid dispersed camping



- Use camping areas between the canals for overflow capacity
- Develop pilot reservation program in Roadrunner Campground
- Close Osborne Overlook to camping
- Install kiosks and interpretive areas at Osborne Overlook and near public phones at Gecko Road, Gecko Campground, Roadrunner Campground
- Increase law enforcement rangers on weekends
- Add one emergency medical service (EMS) rescue buggy
- Restrict commercial filming to avoid conflicts with recreation use
- Tie product vending to those that benefit OHV recreational experience
- Allow vending as described in the RAMP
- Designate commercial vehicle weight limit
- Grade and treat access roads between canals with dust palliative
- Implement traffic control at Gecko Rd and at intersection of Gecko Road and SR-78
- Implement fee entry and construct traffic control area at Gecko Road
- Construct ranger station at Osborne Overlook
- Resurface and maintain Osborne Overlook
- Construct parking lot at base of Osborne Overlook
- Construct maintenance shed at Ranger station
- Construct fuel station for BLM use
- Remove residence/ranger station trailer, replace with permanent housing
- Construct additional housing/parking facilities for BLM staff
- Implement fee entry and construct traffic control area at Gecko Road

#### **2.5.4 Glamis Management Area and Management Measures**

The Glamis Management Area would be managed under the ROS Roded Natural classification, which emphasizes a natural appearing environment. Facilities would be designed and constructed to accommodate conventional motorized use. Currently, this area is used for camping, OHVs, and commercial vending. It also contains rights-of-way use. The level of use on nonholiday weekends is moderate, increasing to high on holiday weekends. Specific management actions that would be implemented in this area under the Draft RAMP are:

- Allow camping east of Glamis and the UPRR tracks
- Apply and maintain dust palliative on the wash road



- Grade the roads regularly
- Construct pit toilets in Glamis Flats and Washes areas
- Close Oldsmobile Hill and Competition Hill from sundown to sunup

### 2.5.5 Adaptive Management Area and Management Measures

The Adaptive Management Area has the most widely diverse habitat in the ISDRA, and historical recreational use of the area is low to moderate (i.e., use is limited to the OHV fuel capacity). It would be managed under the Semi-Primitive Motorized ROS classification. The Adaptive Management Area would be managed to provide recreational opportunities while allowing for the conservation of habitat and plants and species of concern. Specific management actions that would be implemented in this area under the Draft RAMP are:

- Access allowed via permit only; requires driver to pass a resource conservation exam
- No facilities or commercial activity allowed
- Establish a focused biological monitoring program (see RAMP, Appendix 1)
- Interpretive signs allowed
- Visitor use limited to 75 OHV groups (7 vehicles per OHV group) per day (a maximum of 525 vehicles per day)

### 2.5.6 Olgilby Management Area and Management Measures

The Olgilby Management Area is currently used for camping, OHVs and rights-of-way and is characterized by low use on nonholiday weekends, with moderate use on holiday weekends. This area would be managed under the Roaded Natural classification of the ROS spectrum. Management actions would focus on protection of natural, cultural, scenic, ecological resources, including threatened and endangered species. This management objective would allow OHV-recreational opportunities for families and other groups that seek an area within the ISDRA offering low-to-intense concentration of OHV recreation activity. Minimal restrictions will be placed on the groups that recreate within the management area. Specific management actions that would be implemented in this area under the Draft RAMP are:

- Allow camping and OHV use
- No road improvements implemented
- No recreational facilities or other developments constructed
- Implement aggressive outreach programs for habitat conservation and resource protection

### 2.5.7 Dune Buggy Flats Management Area and Management Measures

The Dune Buggy Flats Management Area is located north of I-8 along the western border of the Plan Area. This area is currently used for camping, OHVs, commercial vending, and rights-of-way. Under the Draft RMP, this area would be managed under the Roaded Natural classification of the ROS spectrum. Specific management actions that would be implemented in this area under the Draft RAMP are:



- Apply and maintain dust palliative on the wash road
- Grade the entrance roads
- Construct pit toilets

### **2.5.8 Buttercup Management Area and Management Measures**

The Buttercup Management Area would be managed under the Rural classification under the ROS. This area is currently used for camping, OHVs, sightseeing, commercial vending, education, filming, and rights-of-way. Specific management actions that would be implemented in this area under the Draft RMP are:

- Designate camping sites based on results of pilot test at Gecko Management area
- Designate interpretive area near Greys Well Road with parking and facilities
- Construct semipermanent ranger station (EMS room, toilets, water well, parking, septic, storage)
- Construct semipermanent law enforcement facility (parking and helipad, storage area)
- Construct interpretive facilities near Greys Well Road
- Repair fencing around Plank Road
- Repair/update all Plank Road exhibits
- Build parking for busses on Greys Well Road with pit toilets
- Commercial allowed with additional construction for parking/rangers

### **2.5.9 Buffer Zone Management Area and Management Measures**

The Buffer Zone Management Area is outside the ISDRA but is included in the Draft RAMP. This management area would provide a 1-mile buffer zone around the ISDRA boundary, the intent of which is to reduce the potential effects of the ISDRA-related activities on property outside the ISDRA boundary. The area encompasses sand and gravel mining, military bombing ranges, private lands, and management areas for the desert tortoise and the flat-tailed horned lizard. The BLM currently manages lands within this management area as limited access or closed, and this approach would continue under the Draft RMP. This area is currently used for mining, OHVs, camping, hunting, rights-of-way, and military exercises. Specific management actions that would be implemented in this area under the Draft RAMP are:

- No camping allowed
- Motorized recreation limited to existing roads and trails
- Add signage on no camping/road use

## **2.6 Biological Resource Goals and Objectives of the RAMP**

The management plan contains two primary goals for the ISDRA regarding biological resources:



- Maintain viable populations of all native species throughout ISDRA. The ISDRA contains unique species of plants, invertebrates, and wildlife each with its own unique habitat requirements. The monitoring of threatened or listed species, as well as the monitoring of highly visible indicator species such as the fringe-toed lizard or giant Spanish needle, will be used to measure the health of the habitat. The plan is to monitor a representative group of species to determine the viability of the native species as a whole.
- Maintain habitat connectivity throughout the ISDRA. The purpose of this goal is to limit habitat fragmentation and maintain transfer of genetic material from all subpopulations throughout the ISDRA. Such genetic transfer is essential to maintaining viable populations.

The biological resources management objectives are:

- Ensure the continued existence of all native species in each management area where appropriate habitat exists naturally
- Maintain habitat continuity between management areas
- Monitor native species as described in Appendix 1 of the Draft RAMP

## 2.7 RAMP Monitoring Plan

Appendix 1 of the RAMP provides the methodology to monitor species of concern in the ISDRA. This annual monitoring of Peirson's milk-vetch to estimate density (number of plants/unit area) and population size. Appendix 1 provides the methodology to monitor species of concern in the ISDRA. Through monitoring and analysis of the monitoring data, BLM will determine the impacts to species of concern due to recreational use of the ISDRA. Management of recreational use, especially in the adaptive area, will be evaluated periodically in light of the results of this monitoring, and revised as needed to achieve a balance of providing a high level recreational area and conserving species of concern.

For Peirson's milk-vetch, as well as Algodones Dunes sunflower (*Helianthus niveus* ssp. *Tephrodes*) and sand food (*Pholisma sonora*), estimates will be made separately for the Mammoth Wash area, North Algodones Wilderness, Open Area south of SR-78 and north of Adaptive Management Area, Adaptive Management Area, and Open Area south of Adaptive Management Area. These estimates can also be combined into a single estimate for the entire ISDRA using the appropriate formula for stratified random sampling. The analysis of the yearly monitoring is described in detail in the RAMP.

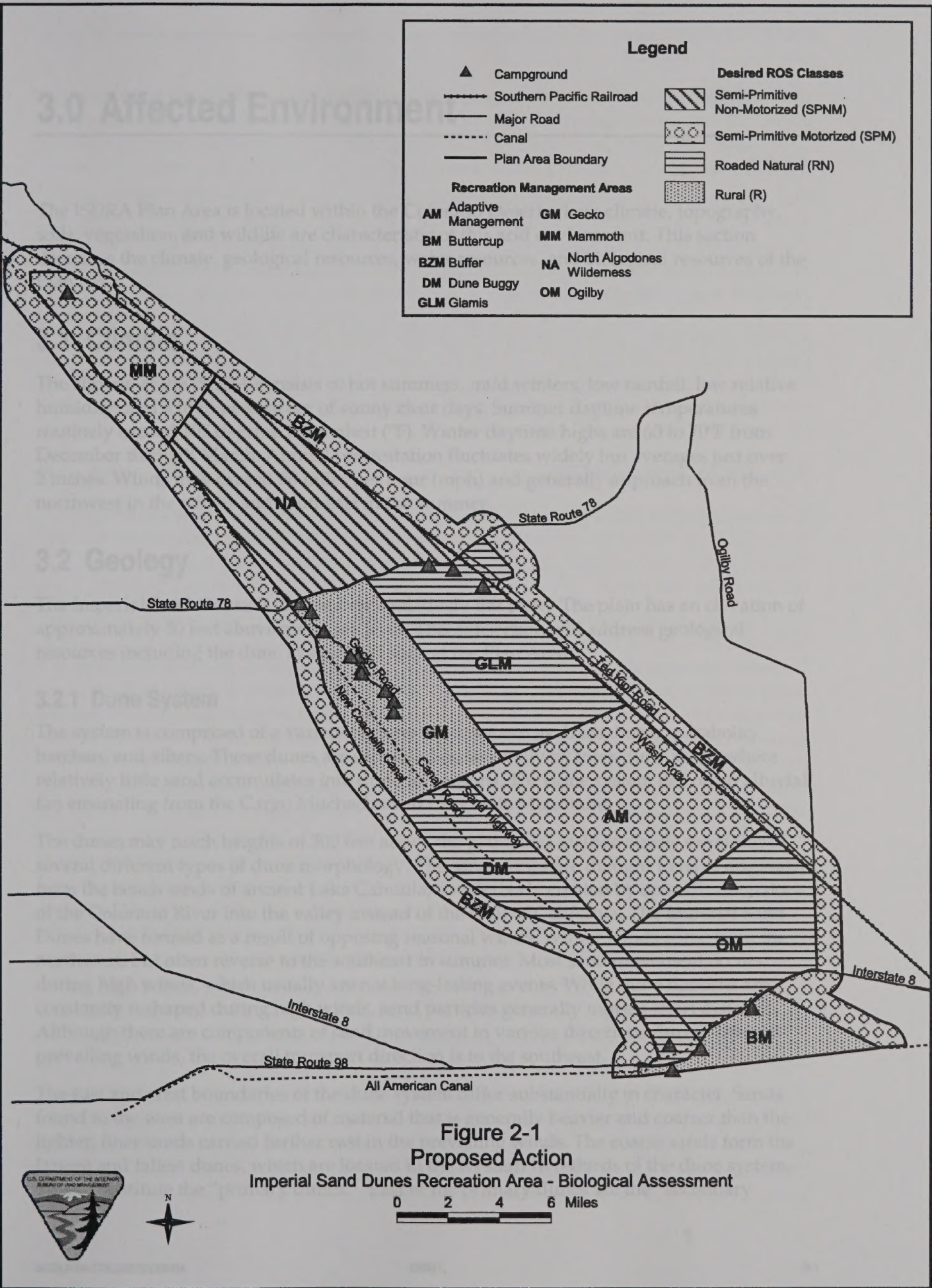
Psammophytic and desert microphyll woodland vegetation will also be monitored. For psammophytic vegetation, both the cover and density of perennial plants will be estimated annually. Changes in total vegetation cover and the cover of at least the most dominant species would be analyzed. Monitoring of desert microphyll woodland vegetation would be conducted annually, but monitoring of specific areas would be done on a 5-year rotation using the protocol currently being developed by BLM to monitor riparian and wetland vegetation desertwide. It is expected that this protocol will be finalized in time for monitoring in spring 2003. Monitoring to estimate the density of Colorado Desert



fringe-toed lizards (*Uma notata*) in a comparison of open and closed areas in terms of OHV use would be continued.

The analysis will compare responses between areas (particularly between the wilderness area and the Adaptive Management Area) and determine whether responses are *parallel* with one another (i.e., a decline in the population size in the Adaptive Management Area is mirrored by a similar decline in the wilderness area or an increase in the Adaptive Management Area is accompanied by a similar increase in the wilderness area). If the responses are not parallel, the BLM will then look for a reason. The reason could be OHV use in the Adaptive Management Area, different amounts of growing season precipitation in the two areas, or a combination of both. Weather station data (discussed in Appendix 1 of the RAMP) will be examined to determine if the lack of parallel response is due to rainfall. OHV use data will also be examined to determine if an increase or decrease in OHV use levels is responsible for the difference.











## 3.0 Affected Environment

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The ISDRA Plan Area is located within the Colorado Desert where climate, topography, soils, vegetation, and wildlife are characteristic of this arid environment. This section describes the climate, geological resources, water resources, and biological resources of the Plan Area.

### 3.1 Climate

The climate at the ISDRA consists of hot summers, mild winters, low rainfall, low relative humidity, and a high percentage of sunny clear days. Summer daytime temperatures routinely exceed 105 degrees Fahrenheit (°F). Winter daytime highs are 60 to 70°F from December through March. Annual precipitation fluctuates widely but averages just over 2 inches. Winds may exceed 50 miles per hour (mph) and generally approach from the northwest in the winter and southeast in the summer.

### 3.2 Geology

The Imperial Sand Dunes is situated on a relatively flat plain. The plain has an elevation of approximately 50 feet above mean sea level. This subsection will address geological resources including the dune system and soils at the Plan Area.

#### 3.2.1 Dune System

The system is comprised of a variety of dune types known as draas, linear, parabolic, barchan, and zibars. These dunes are separated occasionally by inter-dune areas, where relatively little sand accumulates into dune formations. The dune system lies on an alluvial fan emanating from the Cargo Muchacho and Chocolate Mountains.

The dunes may reach heights of 300 feet above the plain, and include classic examples of several different types of dune morphology. The sand dunes are thought to have originated from the beach sands of ancient Lake Cahuilla, a waterbody created by episodic diversions of the Colorado River into the valley instead of the Gulf of California. The Imperial Sand Dunes have formed as a result of opposing seasonal winds. Winter winds come from the northwest, but often reverse to the southeast in summer. Most sand movement occurs during high winds, which usually are not long-lasting events. While dune deposits are constantly reshaped during high winds, sand particles generally move a short distance. Although there are components of sand movement in various directions during seasonal prevailing winds, the overall transport direction is to the southeast.

The east and west boundaries of the dune system differ substantially in character. Sands found to the west are composed of material that is generally heavier and coarser than the lighter, finer sands carried further east in the prevailing winds. The coarse sands form the largest and tallest dunes, which are located in the western two-thirds of the dune system. These constitute the “primary dunes.” East of the primary dunes are the “secondary



dunes," which are smaller dunes composed of finer sands and having more vegetative cover.

### 3.2.2 Soils

The dunes are composed of sand that is 60 to 70 percent quartz, 30 to 40 percent feldspar with very minor amounts of biotite, magnetite, garnet, and epidote. A large percentage of the grains are coated with ferric oxide, resulting in a pale orange cast to the sand. A majority of the sand grains are subrounded to subangular. Grain size decreases from west to east across the dunes indicating the source is from the west.

The U.S. Department of Agriculture (USDA) soil survey for Imperial County classified the dune sand as "Rositas fine sand." Typically, Rositas soil is a reddish-yellow fine sand that reaches a depth of 60 inches. This soil is somewhat excessively drained where the effective rooting depth is 60 inches or more. The USDA identified the soils as having little potential for farming, home sites, and urban areas.

## 3.3 Water Resources

Major water bodies in the extended vicinity of the Plan Area include the Salton Sea and Colorado River. There are limited water resources in the immediate vicinity of the ISDRA. This subsection will address water resources including surface waters and ephemeral washes at the Plan Area.

### 3.3.1 Surface Waters

There are two manmade surface waterways in the vicinity of the dunes, the All American Canal and the New Coachella Canal. The All American Canal has a bottom width of approximately 160 feet and depth of about 21 feet. The canal is lined with clay to minimize seepage. The capacity of the canal is 10,155 cubic feet per second (cfs) in the vicinity of the Imperial Sand Dunes. Although the All American Canal is lined, a substantial amount of water is believed to be lost through seepage. The New Coachella Canal is connected to the All American Canal at what is known as Drop 1 in the eastern portion of the Plan Area. The Coachella Canal, originally completed in 1949 as an unlined channel, had a flow capacity of approximately 2,500 cfs. The canal extends northwesterly from Drop 1 for approximately 123 miles and runs along the east side of the Salton Sea and west of the Plan Area. The first 48 miles of the original Coachella Canal were replaced with a new canal called the New Coachella Canal in the early 1980s due to concerns about water loss through seepage in the East Mesa area. The original Coachella Canal has been abandoned.

The 48-mile New Coachella Canal has a flow capacity of approximately 1,550 cfs and is concrete lined to prevent seepage. Operating roads are located along either side of the new canal. The New Coachella Canal has a bottom width of approximately 16 feet and ranges in depth from 10 to 12 feet.

Seepage from the Old Coachella Canal provided a water source and habitat along the canal that supported various forms of wildlife. With construction and operation of the concrete lined New Coachella Canal and the subsequent abandonment of the southern portion of the Old Coachella Canal, wildlife became displaced. To partially mitigate the loss of habitat and prevent any further drowning of wildlife that became entrapped in the canal, the California



Department of Fish and Game (CDFG) installed four water wells in the North Algodones Wilderness Area and two water wells in the Mammoth Wash Area. Windmills were installed to pump the water into wildlife guzzlers. The guzzlers have created limited wetland and green areas within the Plan Area that not only provide a source of water but habitat and forage for wildlife.

### 3.3.2 Ephemeral Washes

From the north and east, the Chocolate and Cargo Muchacho Mountains drain into an alluvial fan containing numerous ephemeral washes that terminate at the eastern boundary of the ISDRA. The surface flows and pools generally occur in the winter and spring seasons of wet years, but can occur at other times. The water does not remain on the surface for long periods following rains due to the porous nature of the soils. The ephemeral washes provide an important water source needed to support the microphyll woodland habitat and numerous wildlife species along the eastern boundary of the ISDRA.

## 3.4 Biological Resources

This subsection describes habitat types as background information on the Peirson's milk-vetch, desert tortoise, and flat-tailed horned lizard.

### 3.4.1 Habitat Types

The biological resources of the Plan Area include several habitat types that support a variety of plant and wildlife species, including special-status, sensitive, rare, and endemic species. The primary habitat types found within the Imperial Sand Dunes include creosote bush scrub, psammophytic scrub, microphyll woodland, and canal-influenced vegetation. These habitats are depicted in Figure 3-1.

#### 3.4.1.1 Creosote Bush Scrub

Creosote bush scrub is the most common habitat type in the Colorado Desert and typically occurs on well-drained secondary soils of slopes, fans, and valleys. Within the ISDRA, this habitat type occurs within the relatively stable soils along the periphery of the dune system. It rarely occurs in the central portion of the ISDRA where shifting dunes are prevalent. This habitat type is generally characterized by relatively barren ground between widely spaced shrubs. To the west of the ISDRA, the habitat consists of almost pure stands of creosote bush. On the eastern boundary of the ISDRA, this community is more diverse due to the topographic relief of the dunes and runoff from the nearby Chocolate and Cargo Muchacho Mountain ranges. The creosote bush scrub vegetation within the alluvial fan between the desert washes forms a transitional zone with the microphyll woodland habitat.

Characteristic plant species that primarily comprise this habitat type include creosote bush (*Larrea tridentata*), brittlebush (*Encelia farinosa*), and burrobrush (*Ambrosia dumosa*). Less abundant species that are associated with this habitat type include woolly desert marigold (*Baileya pleniradiata*), birdcage evening-primrose (*Oenothera deltooides*), dyebush (*Dalea emoryi*), longleaf jointfir (*Ephedra trifurca*), desert thorn-apple (*Datura discolor*), big galleta (*Hilaria rigida*), white rhatany (*Krameria grayi*), and brown plume wirelettuce (*Stephanomeria pauciflora*).



The wildlife commonly associated with this habitat type include desert iguana (*Dipsosaurus dorsalis*), zebra-tailed lizard (*Callisaurus draconoides*), western whiptail lizard (*Cnemidophorus tigris*), Red-tailed Hawk (*Buteo jamaicensis*), Mourning Dove (*Zenaida macroura*), Lesser Nighthawk (*Chordeiles acutipennis*), Black-tailed Gnatcatcher (*Poliophtila melanura*), Yellow-rumped Warbler (*Dendroica coronata*), White-crowned Sparrow (*Zonotrichia leucophrys*), big brown bat (*Eptesicus fuscus*), kit fox (*Vulpes macrotis*), roundtail ground squirrel (*Spermophilus tereticaudus*), and black-tailed hare (*Lepus californicus*). Special-status or sensitive wildlife species that may occur in this habitat include desert tortoise, flat-tailed horned lizard, Western Burrowing Owl (*Athene cunicularia*), and LeConte's Thrasher (*Toxostoma lecontei*). The endemic Hardy's dune beetle (*Anomala hardyorum*) and Carlson's dune beetle (*Anomala carlsoni*) are also found in this habitat type (Hardy and Andrews, 1979).

#### 3.4.1.2 Psammophytic Scrub

Psammophytic ("sand loving") scrub occurs within the interior dune system where active and partially stabilized dunes are found. This habitat type is typically situated between active dunes in depressions that are commonly termed "bowls." The soils in these areas consist primarily of fine sand. As the dunes shift from year to year, the bowls generally shift as well. Vegetation is adapted to relatively high sand mobility and deep water percolation. Most of these plant species are capable of rapid growth given favorable soil moisture conditions.

Common plants of this habitat type include Mormon tea (*Ephedra nevadensis*), desert buckwheat (*Eriogonum deserticola*), desert dicoria (*Dicoria canescens*), common sandpaper plant (*Petalonyx thurberi*), desert panicum (*Panicum urvilleanum*), and plicate coldenia (*Tiquilia plicata*). Additionally, birdcage evening primrose and desert lily (*Hesperocallis undulata*) may occur in the relatively stable dunes that form a transitional zone with the creosote bush scrub habitat. Special-status, rare, or sensitive plant species that are known to occur in this habitat include Peirson's milk-vetch, Algodones Dunes sunflower (*Helianthus niveus* ssp. *tephrodes*), Wiggins' croton (*Croton wigginsii*), giant Spanish needle (*Palafoxia arida* var. *gigantea*), sand food (*Pholisma sonora*), and Borrego milk-vetch (*Astragalus lentiginosus* var. *borreganus*).

The wildlife commonly associated with psammophytic scrub include Black-tailed Gnatcatcher, Mourning Dove, Cliff Swallow (*Hirundo pyrrhonota*), coyote (*Canis latrans*), roundtail ground squirrel, desert kangaroo rat (*Dipodomys deserti*), and black-tailed hare. The Colorado desert fringe-toed lizard (*Uma notata*) is the only sensitive wildlife species known to almost exclusively inhabit this area. The endemic Andrew's dune scarab beetle (*Psuedocotalapa andrewsi*) is also found in this habitat type (Hardy and Andrews, 1979).

#### 3.4.1.3 Microphyll Woodland

To the east of the dune system is a large alluvial fan draining the Chocolate and Cargo Muchacho Mountains. The alluvial fan is dissected by numerous ephemeral washes and separated by expansive, level interfluvies. The desert microphyll woodland typically is best developed in the larger drainages where dense stands of a variety of trees occur. Microphyll woodland is generally found along the margins of these dry channels, and around the cul-



de-sac sinks of their termini. Vegetation is generally sparse in the open wash areas between the sinks.

Characteristic plants of this habitat type include palo verde (*Cercidium floridum*), ironwood (*Olneya tesota*), smoke tree (*Psoralea arguta*), and to a lesser degree honey mesquite (*Prosopis glandulosa*), desert willow (*Chilopsis linearis*), desert unicorn plant (*Proboscidea altheaefolia*) and big galleta. Depending upon rainfall, the understory in the plains is generally composed of shrubs and annuals such as desert starvine (*Brandegea bigelovii*), carrizo mallow (*Sphaeralcea orcuttii*), California threeawn, Mediterranean grass (*Schismus barbatus*), lineleaf white puff (*Oligomeris linifolia*), and rush milkweed (*Asclepias subulata*).

The plant diversity and relative density, combined with the micro-topographic variability associated with the washes, accounts for a high diversity of wildlife in the microphyll woodland. Wildlife commonly associated with this habitat type include side blotched lizard (*Uta stansburiana*), western whiptail lizard, zebra-tailed lizard, sidewinder rattlesnake (*Crotalus cerastes*), Red-tailed Hawk, Gambel's Quail (*Lophortyx gambelli*), Mourning Dove, Ladder-backed Woodpecker (*Picoides scalaris*), Verdin (*Auriparus flaviceps*), Western Flycatcher (*Empidonax difficilis*), Cactus Wren (*Campylorhynchus burnsi*), Warbling Vireo (*Vireo gilvus*), Wilson's Warbler (*Wilsonia pusilla*), House Finch (*Carpodacus mexicanus*), Black-tailed Gnatcatcher, and White-crowned Sparrow (*Zonotrichia leucophrys*), western pipistrelle bat (*Pipistrellus hesperus*), coyote, kit fox, mule deer (*Odocoileus hemionus*), white-tailed antelope squirrel (*Ammospermophilus leucurus*), black-tailed hare, and desert cottontail (*Sylvilagus audubonii*). Special-status or sensitive wildlife species that may occur in this habitat include desert tortoise, Couch's spadefoot toad (*Scaphiopus couchi*), Gila Woodpecker (*Melanerpes uropygialis*), Western Burrowing Owl, and LeConte's Thrasher.

Wildlife guzzlers were installed by the CDFG to partially mitigate impacts from the construction of the New Coachella Canal. The guzzlers have created limited herbaceous weedy vegetation within the microphyll woodland. The presence of water and forage around the guzzlers has attracted mule deer from the Chocolate Mountain range. Mule deer are known to use the microphyll woodland associated with the washes as corridors through the Algodones Dunes Wilderness Area and into the southern part of the Mammoth Wash area. It is thought that the Yuma puma (*Felis concolor browni*) has followed the deer into the woodland to feed upon this important prey species.

#### 3.4.1.4 Canal-Influenced Vegetation

Both the Coachella and All American Canals support hydrophytic vegetation that is subject to periodic eradication efforts. Although the canals are lined, some seepage occurs and promotes the growth of hydrophytic vegetation. Submergent and upland species include shortspike watermilfoil (*Myriophyllum exallescens*) and fennel-leaf pondweed (*Potamogeton pectinatus*). Emergent species include cattails (*Typha* spp.), spotted cadythumb (*Polygonum fusiforme*), horseweed (*Conyza canadensis*), spiny chloracantha (*Aster spinosus*), giant reed (*Arundo donax*), small-flowered tamarisk (*Tamarix parviflora*), false daisy (*Eclipta alba*), common sunflower (*Helianthus annuus*), white sweetclover (*Melilotus albus*), and arrow weed (*Pluchea sericea*).

This manmade habitat is utilized by a variety of birds including American Coot (*Fulica americana*), Red-wing Blackbird (*Agelaius phoeniceus*), Yellow-headed Blackbird



(*Xanthocephalus xanthocephalus*), Common Yellowthroat (*Geothlypis trichas*), and Marsh Wren (*Cistothorus palustris*). Common mammals that occur in this habitat include black-tailed hare, coyote, raccoon (*Procyon lotor*), and American badger (*Taxidea taxus*).

### 3.4.2 Species Accounts

#### 3.4.2.1 Peirson's Milk-vetch

##### **Status**

Peirson's milk-vetch was proposed as endangered in 1992 and listed as threatened in 1998 (Federal Register, 1998). It is also recognized as endangered by the State of California and as a special status species by the BLM. The California Native Plant Society (CNPS) lists the milk-vetch as a category 1B (rare, threatened, or endangered in California and elsewhere throughout its range) (Tibor, 2001). Critical habitat has not been designated for this species, and a recovery plan has not been produced by the USFWS.

##### **Life History**

Peirson's milk-vetch is a short-lived perennial reaching 8 to 30 inches high. The stems and leaves are pubescent, and the leaves are 5 to 15 centimeters (cm) long. The flowers are dull purple and are arranged in 10 to 17 flowered racemes. The resulting seed pods are 0.8 to 1.5 inches long and are inflated with a triangular beak (Bowers, 1996).

This species is able to become reproductive in a single season. It generally completes seed production by June. By July, the plant has dropped many of its leaflets and some entire leaves. This condition may persist from July to October. Seedlings may be present in December, although not in great numbers. Seedlings that germinate by November or December may reach the flowering or fruiting stage by March (Romsper and Burk, 1979).

Seeds of the Peirson's milk-vetch are the largest of any North American milk-vetch species (Barneby, 1964). Within this genus, the large seeds are thought to be better adapted to active dunes than small seeds. This may be due to the larger food reserves enabling them to emerge even when deeply buried (Bowers, 1996). Harper et al. (1970), however, noted that a trade-off exists between seed size and seed numbers such that large-seeded plants typically produce fewer seeds.

Chadwick & Dalke (1965) pointed out that soil water is more readily available to plants in sand than in clay, which may facilitate seed imbibition and germination. Moreover, even during drought, dune sand retains moisture at depths greater than 12 inches (Shreve, 1938; Chadwick & Dalke, 1965; Sharp, 1966; Prill, 1968; Bowers, 1982). This literature suggests that seedlings such as the Peirson's milk-vetch capable of rapid root elongation might readily survive seasonal drought conditions.

Romsper and Burk (1979) noted in their study that seed viability of the Peirson's milk-vetch remained high for at least 1 year under laboratory storage conditions. This plant also required no pregermination treatment and showed increased germination success when the seeds were scarified. Scarification was accomplished in a laboratory setting through tumbling with sand from the dunes. Within this same setting, milk-vetch seeds germinated best at lower and intermediate temperatures (60 to 77°F).



Peirson's milk-vetch seeds are transported within inflated pods that are dispersed by winds across the dunes where they may come to rest within vegetation or depression. Many of the seeds fall prey to the seed beetle family. This contributes to a high mortality of seeds and reduced seed crop for this species (Romspert and Burk, 1979).

Peirson's milk-vetch habitat consists of sandy depressions at the base of high dunes and lower established dunes. This species does not extend many lateral roots and, therefore, is more susceptible if the main stem is broken. The susceptibility of the adult plants in conjunction with the period of seedling establishment during the cooler months, which coincides with the higher usage of the dunes by OHVs, makes this species sensitive to impacts (Romspert and Burk, 1979).

#### ***Distribution and Occurrence within the Plan Area***

Peirson's milk-vetch, an obligate psammophyte, grows on the slopes and hollows of wind-blown dunes in the Colorado and Sonoran deserts. According to Barneby (1964) and Wiggins (1980), it is known from the Imperial Sand Dunes in Imperial County, which extend south of the International Border into northeastern Baja, California. Additionally, the milk-vetch is known to occur in the Gran Desierto in Sonora, Mexico (Felger, 2000). Although it has been reported from Borrego Valley, San Diego County, California, it has not been observed there for several decades (Tibor, 2001).

The only location where the Peirson's milk-vetch is currently known to occur within the United States is the Imperial Sand Dunes, which supports between 75 and 80 percent of all of the world's known colonies of the species (Federal Register, 1998). The milk-vetch is associated with psammophytic scrub habitat within these dunes. The plant is generally scattered throughout the dune complex with a higher abundance of the plant along the central and western aspect of the Imperial Sand Dunes. Figures 3-2, 3-3, 3-4, and 3-5 depict the distribution and abundance of the Peirson's milk-vetch at the ISDRA.

In 1998, the BLM initiated a monitoring study of six special-status plant species including the Peirson's milk-vetch at the Imperial Sand Dunes. Monitoring was conducted in spring and summer 1998, spring 1999, and spring 2000 (Figures 3-2, 3-3, and 3-4). The study was designed to allow comparisons of plant abundance and distribution among these years. To summarize the results, the Peirson's milk-vetch was abundant in 1998, the highest rainfall year, and least abundant in 2000, the lowest rainfall year. The study is presented in *Monitoring of Special-Status Plants in the Algodones Dunes, Imperial County, California* (BLM, 2001).

In 2001, the American Sand Association (ASA) retained the services of Thomas Olsen Associates, Inc. (TOA) to provide an independent assessment of the abundance, distribution, and life history of the Peirson's milk-vetch at the Imperial Sand Dunes. Data were also collected on five other dune plant species as well. Unlike the BLM monitoring effort, this study was designed to obtain an actual plant census. A total of 71,926 individual milk-vetch plants was recorded during the course of this survey (Figure 3-5). Occurrences of Peirson's milk-vetch were generally clustered and distributed west of the primary dunes in association with the western line of the intermediate active dunes. The distribution of the milk-vetch was considered dependent on the geomorphology of the dunes. Plants were concentrated in areas where there was relative substrate stability. These areas were generally located on the lee side of the large dunes in areas where the surface gradually



slopes upwards from deep or shallow basins at the base of steep slip faces. This studies results were presented in *Biology, Distribution, and Abundance of Peirson's Milkvetch and Other Special Status Plants of the Algodones Dunes, California* (TOA, 2001).

### **Threats**

OHV use and associated recreational development have been described as the primary threat to Peirson's milk-vetch through destruction of individual plants and habitat (Luckenbach and Bury, 1983; ECOS, 1990; Federal Register, 1998).

### **3.4.2.2 Desert Tortoise**

#### **Status**

The Mojave population of the desert tortoise was emergency listed by the USFWS as an endangered species in 1989. Under final rule, this population was federally listed as threatened in 1990 (Federal Register, 1990). The State of California listed this species as threatened in 1989. The BLM recognizes the desert tortoise as a special-status species. Currently, the BLM is drafting several management plans including the West Mojave Coordinated Management Plan (WEMO), Northern and Eastern Mojave Coordinated Management Plan (NEMO), and Northern and Eastern Colorado Coordinated Management Plan (NECO) with an important focus on the management and conservation of the desert tortoise. A final recovery plan was completed by the USFWS in 1994 (USFWS, 1994). Critical habitat was designated in 1994 (Federal Register, 1994). The Chuckwalla Bench Critical Habitat Unit (CHU) is located less than 5 miles northeast of the ISDRA.

#### **Life History**

The desert tortoise is a large herbivorous terrestrial reptile. It has a high domed shell that may reach a length of 15 inches or more. The animal has stocky, elephant-like limbs and a short tail. The carapace (upper shell) is brown and the plastron (lower shell) is yellow in color, both exhibiting prominent growth lines. Adult males can be distinguished from females by the concavity in their plastron. Adult males also have larger chin glands and a longer tail and gular horn than females (Stebbins, 1985).

The adult desert tortoise is active from mid-March or April to November, and during the winter months is dormant in underground burrows (Luckenbach, 1982; Zimmerman et al., 1994). Desert tortoises will congregate in winter dens during colder weather, then spread out to nearby areas during moderate weather in the spring and fall and retreat into short individual burrows or under shrubs during more the extreme heat of the summer (Woodbury and Hardy, 1940). During the active period, desert tortoises may establish home ranges of approximately 1 square mile. Tortoises feed on a wide variety of herbaceous plants, including cactus, grasses, and annual flowering plants (USFWS, 1994).

Adult desert tortoises reach sexual maturity at 15 to 20 years of age. Mating occurs in the spring (April and May) and the fall (August and September) with nesting and egg laying occurring from May to July (Rostral et al., 1994). The female tortoise lays her eggs in a hole approximately 3 to 4 inches deep that is dug near the mouth of a burrow. Following egg laying, the female covers the eggs with soil (Woodbury and Hardy, 1948). Clutch size ranges from 2 to 14 eggs with an average of 5 to 6 eggs (Luckenbach, 1982). Desert tortoise eggs typically hatch from August through October. These hatchlings are provided a food source in the form of an egg yolk that is assimilated into the underside of the shell. This yolk sac



will sustain the animal for up to 6 months. The hatchling desert tortoise will go into brumation in the late fall, but can be active on warm sunny or rainy days.

#### ***Distribution and Occurrence within the Plan Area***

The desert tortoise is widely distributed throughout the Mojave, Sonoran, and Colorado deserts. It occupies arid regions from southern Nevada and extreme southwestern Utah to northern Sinaloa, Mexico; southwestern Arizona west to the Mojave Desert and the eastern side of the Salton Basin, California (Stebbins, 1985). In the Mojave region, desert tortoises are primarily associated with flats and bajadas with soils ranging from sand to sandy-gravel, but firm enough for the tortoise to construct burrows (USFWS, 1994). In California, the desert tortoise is most commonly found in association with creosote bush scrub with inter-shrub space for growth of herbaceous plants. However, it may also occur in saltbush scrub, desert wash, desert scrub, and Joshua tree woodlands. The desert tortoise is found from below sea level to elevations of 5,000 feet in California. The most favorable habitats occur at elevations of approximately 1,000 to 3,000 feet.

Along the eastern boundary of the ISDRA, the creosote bush scrub habitat and the desert washes north and south of SR-78 provide marginal suitable habitat for the desert tortoise. Desert tortoises have been observed crossing Vista Mine and Ted Kipf Roads by BLM and Border Patrol officials. To date, surveys for desert tortoise have not been conducted at the ISDRA. Desert tortoise distribution and abundance data does not currently exist. The BLM proposes to conduct surveys to collect such data on this species at a latter date.

#### ***Threats***

The decline in the desert tortoise population has been attributed to habitat loss, degradation, and fragmentation resulting from increased human population and urbanization in the deserts of the southwestern United States. Collecting of tortoises for pets, livestock overgrazing, landfills, highway mortality, vandalism, agriculture, fire, drought, and OHV use have all contributed to the decline of the tortoise in the wild (Luckenbach, 1982; Federal Register, 1990). Another important factor identified in tortoise declines is the introduction of an upper respiratory tract disease into many of the wild populations (Berry, 1986). This disease may have been introduced through the release of captive desert tortoises into the wild (USFWS, 1994).

### **3.4.2.3 Flat-tailed Horned Lizard**

#### ***Status***

In California, the flat-tailed horned lizard was designated a sensitive species by the BLM in 1980. In 1988, a petition was submitted to the California Fish and Game Commission (CFGC) to list the species as endangered. In 1989, the commission voted against the proposed listing. In 1993, the USFWS published a proposed rule to list the flat-tailed horned lizard as a threatened species (Federal Register, 1993). No final rule on the proposed listing was issued. In 2001, the USFWS published a notice of reinstatement of the 1993 proposed listing of the flat-tailed horned lizard as a threatened species and reopened the comment period on the proposed rule (Federal Register, 2001). Currently, the State of California and BLM recognizes the flat-tailed horned lizard as a species of special concern and special-status species, respectively.



### **Life History**

The flat-tailed horned lizard has the typical flattened body shape of horned lizards. It is distinguished from other species in its genus by its dark ventral stripe, lack of external openings, broad flat tail, and comparatively long spines on the head (Funk, 1981). The flat-tailed horned lizard has two rows of fringed scales on each side of its body. The species has cryptic coloring, ranging from pale gray to light rust brown dorsally and white or cream ventrally with a prominent umbilical scar. The only apparent external difference between males and females is the presence of enlarged postanal scales in males. Maximum snout-vent length for the species is 3.3 inches (Muth and Fisher, 1992).

Flat-tailed horned lizards escape extreme temperatures by digging shallow burrows in the loose sand. Adults are primarily inactive from mid-November to mid-February. Juvenile seasonal activity is often dependent on temperature fluctuations. Breeding activity takes place in the spring with young hatching in late July and September. The diet of horned lizards typically consists of greater than 95 percent native ant species, mostly large harvester ants (*Pogonomyrmex* spp.).

### **Distribution and Occurrence within the Plan Area**

The flat-tailed horned lizard is found in the low deserts of southwestern Arizona, southeastern California, and adjacent portions of northwestern Sonora and northern Baja. In California, the flat-tailed horned lizard is restricted to desert washes and desert flats in central Riverside, eastern San Diego, and Imperial Counties. The majority of the habitat for the species is in Imperial County (Turner et al., 1980).

The lizard is known to inhabit sand dunes, sheets, and hummocks, as well as gravelly washes. The species is thought to be most abundant in creosote bush scrub habitat. However, this species may also be found in desert scrub, desert wash, succulent shrub, alkali scrub, sparsely vegetated sandy flats, desert pavement, and rocky slopes. They are typically found in dry, hot areas of low elevation (less than 800 feet).

Suitable habitat for the flat-tailed horned lizard is found east of the project area from Ogilby Road and extending south to the All-American Canal (FERC, 2001). Monitoring conducted as part of the North Baja Pipeline Project in 2000 and 2001 detected flat-tailed horned lizard in this area (FERC, 2001). Rado (1995) noted that sand sheets extending east from the sand dunes provide favorable habitat for about a mile northwards from the intersection of Ogilby Road and I-8.

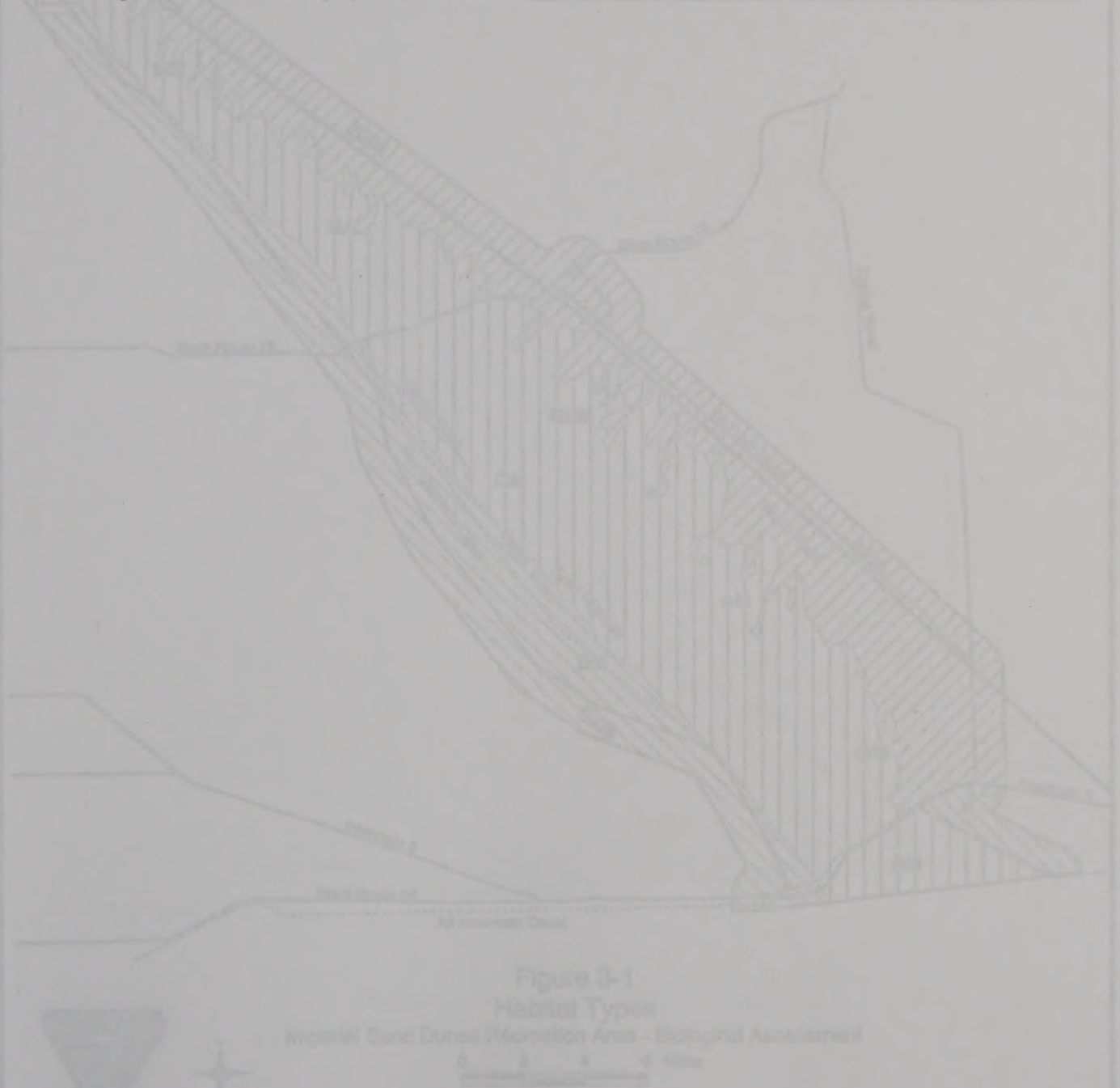
The surveys conducted by the BLM in 1978, 1979, and 1980 reveal that the highest abundance of this species occurs southwest of the ISDRA in the East Mesa Area of Critical Environmental Concern (ACEC). Low abundance of this species was detected on the eastern and western boundaries of the sand dunes, predominantly in the creosote bush scrub habitat. Although this species is known to occur in the central Imperial Sand Dunes, the habitat is considered to be marginal due to the lack of suitable soil structure required to support their predominant prey: harvester ants (BLM, 2001b). Figure 3-6 depicts the distribution and abundance of the flat-tailed horned lizard at the ISDRA.

### **Threats**

Human activities have resulted in the conversion of approximately 34 percent of the historic habitat of the flat-tailed horned lizard. The decline in the flat-tailed horned lizard population



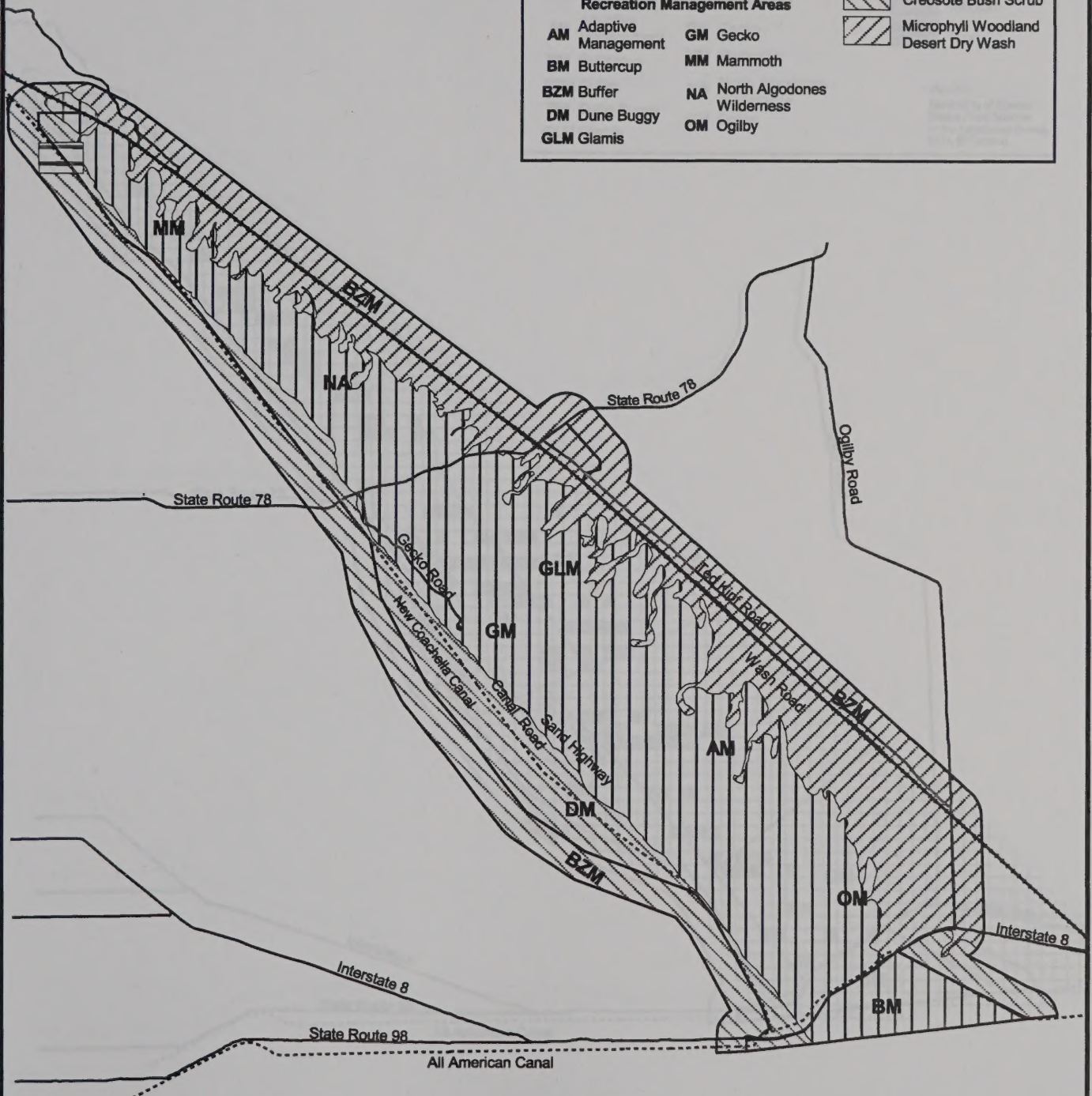
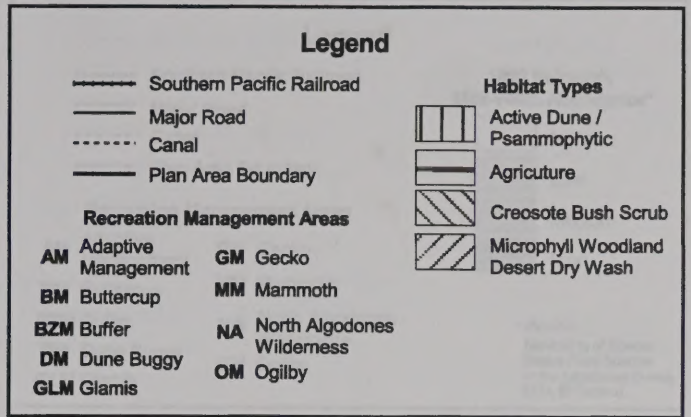
is primarily due to impacts from utility lines, roads, geothermal development, sand and gravel mining, OHV use, waste disposal sites, military activities, pesticide use, and Border Patrol activities (Foreman, 1997). Harvester ants, the primary prey of the horned lizards, are particularly sensitive and easily displaced by Argentine ants (UCSC, 2001). Currently, the Argentine ants (*Linepithema humile*), an invasive species, are moving up the California coastline with drastic effects on native ant species (Gordon, 1997). California harvester ants suffer undue losses, and plants that depend on them for seed dispersal may also suffer. Horned lizard abundance is strongly correlated to the absence of Argentine ants and subsequent presence of native ant species, indicating that the Argentine ants are indirectly affecting the horned lizard population (UCSC, 2001).







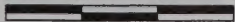




**Figure 3-1**  
**Habitat Types**  
 Imperial Sand Dunes Recreation Area - Biological Assessment



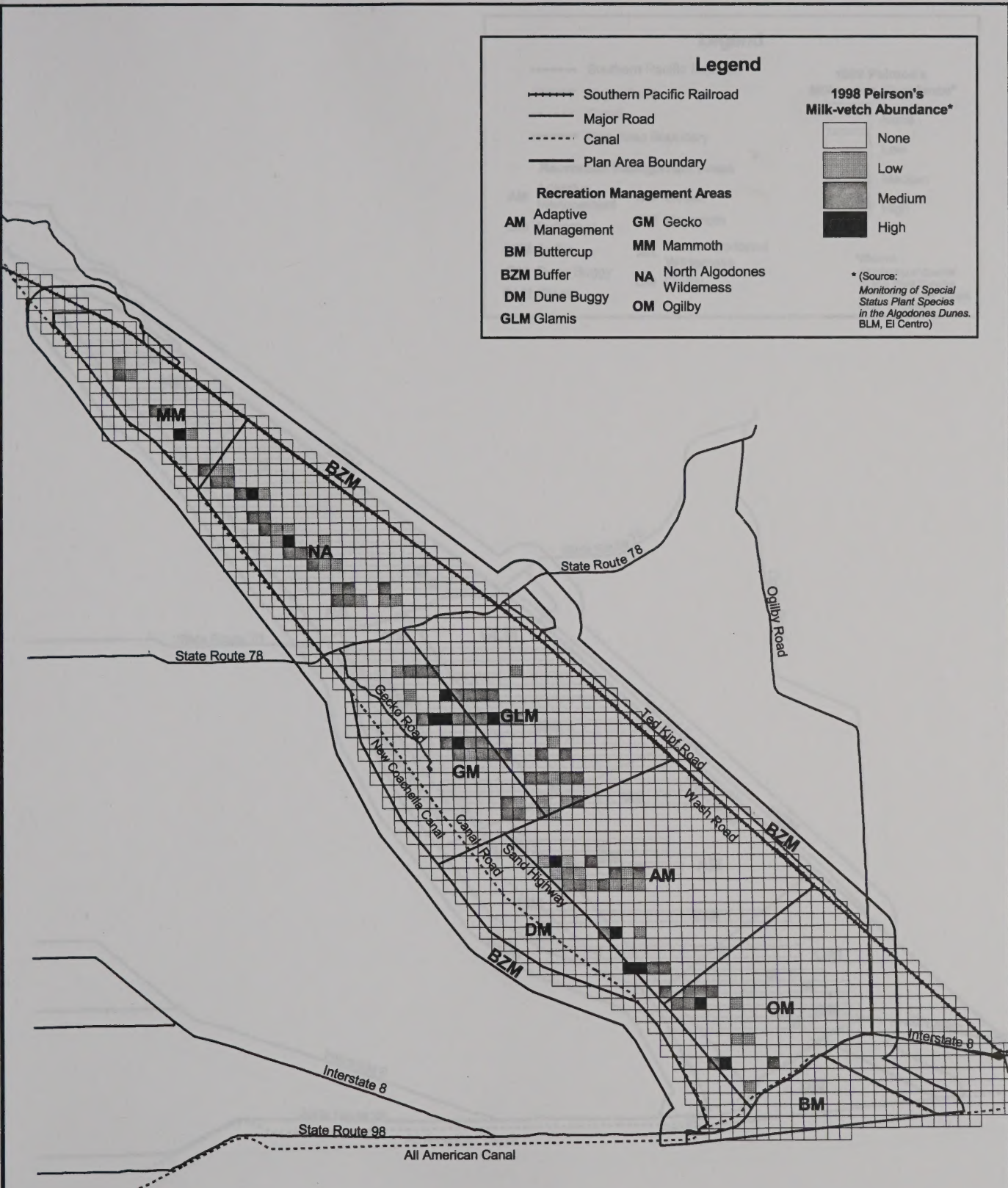
0 2 4 6 Miles











**Figure 3-2**  
**Peirson's Milk-vetch 1998 Distribution**  
 Imperial Sand Dunes Recreation Area - Biological Assessment

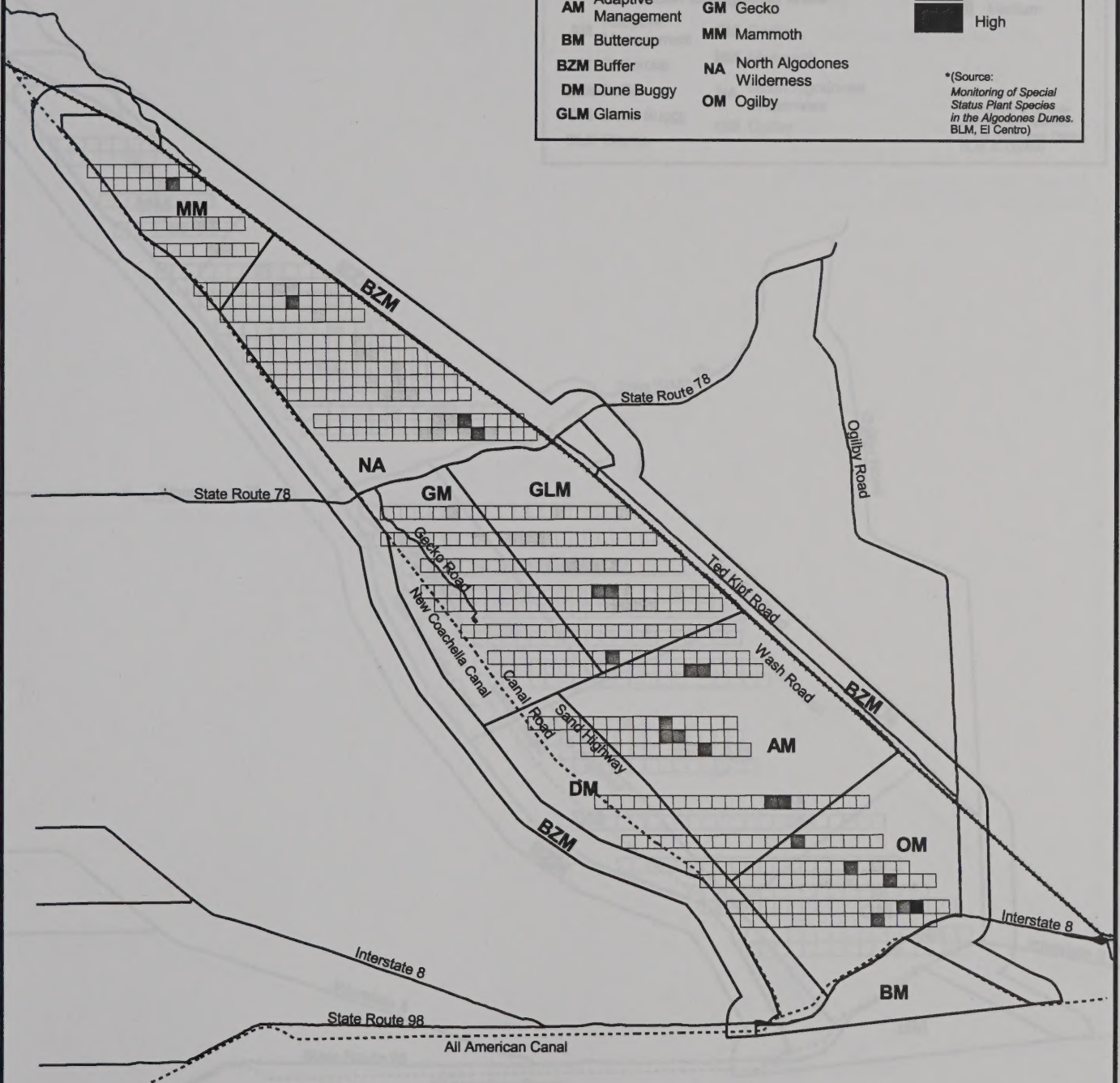
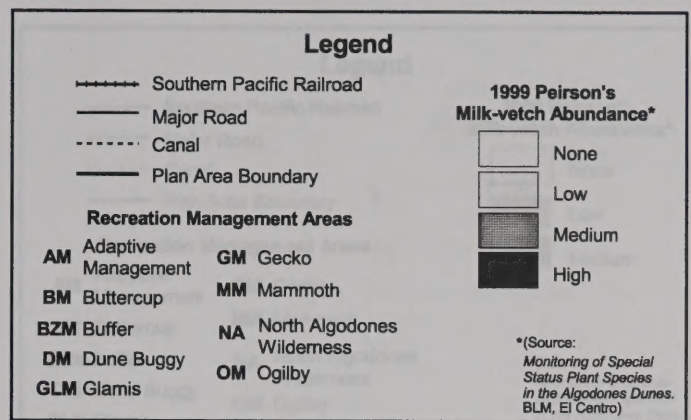


0 2 4 6 Miles









**Figure 3-3**  
**Peirson's Milk-vetch 1999 Distribution**  
**Imperial Sand Dunes Recreation Area - Biological Assessment**

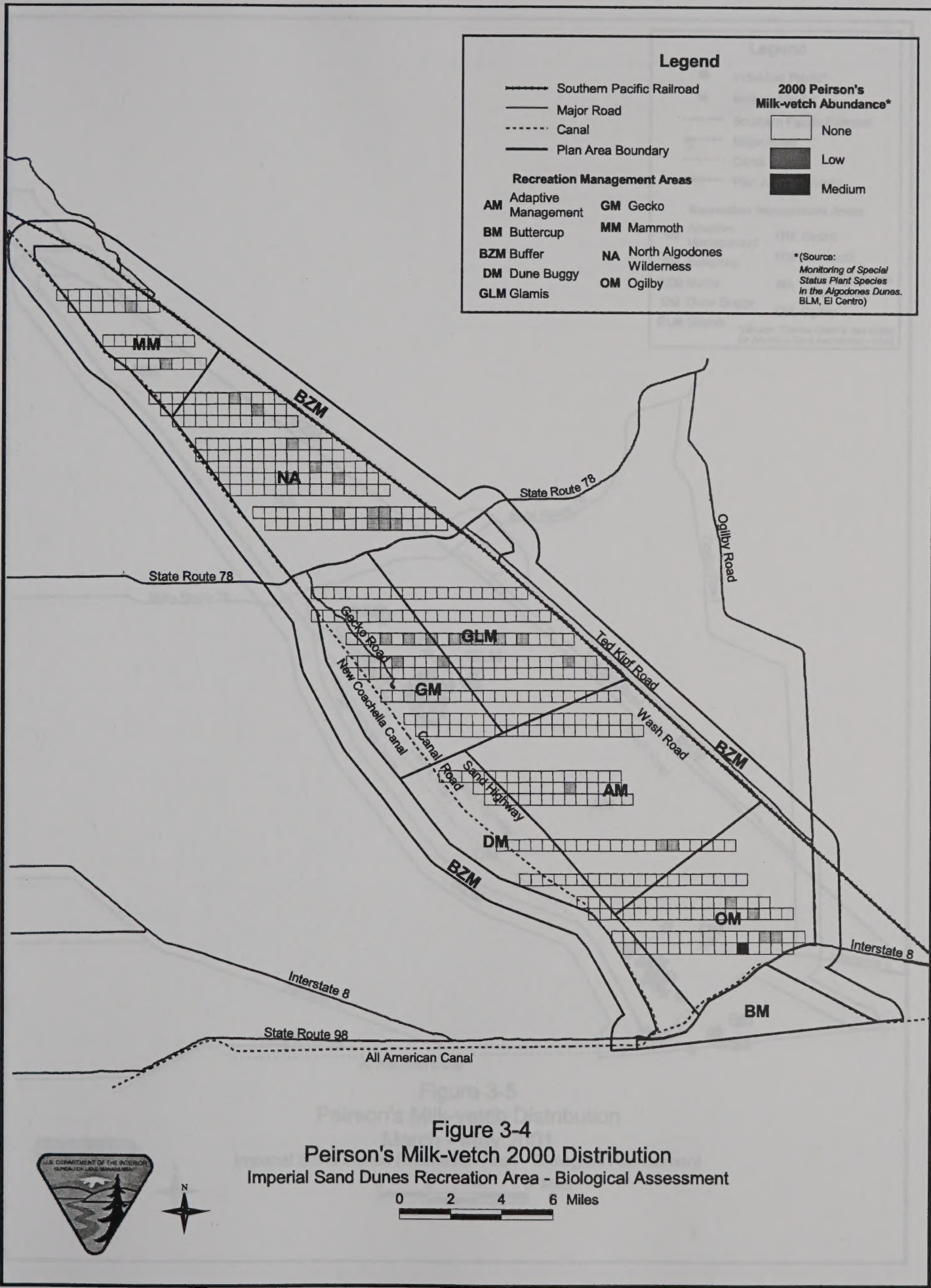
0 2 4 6 Miles







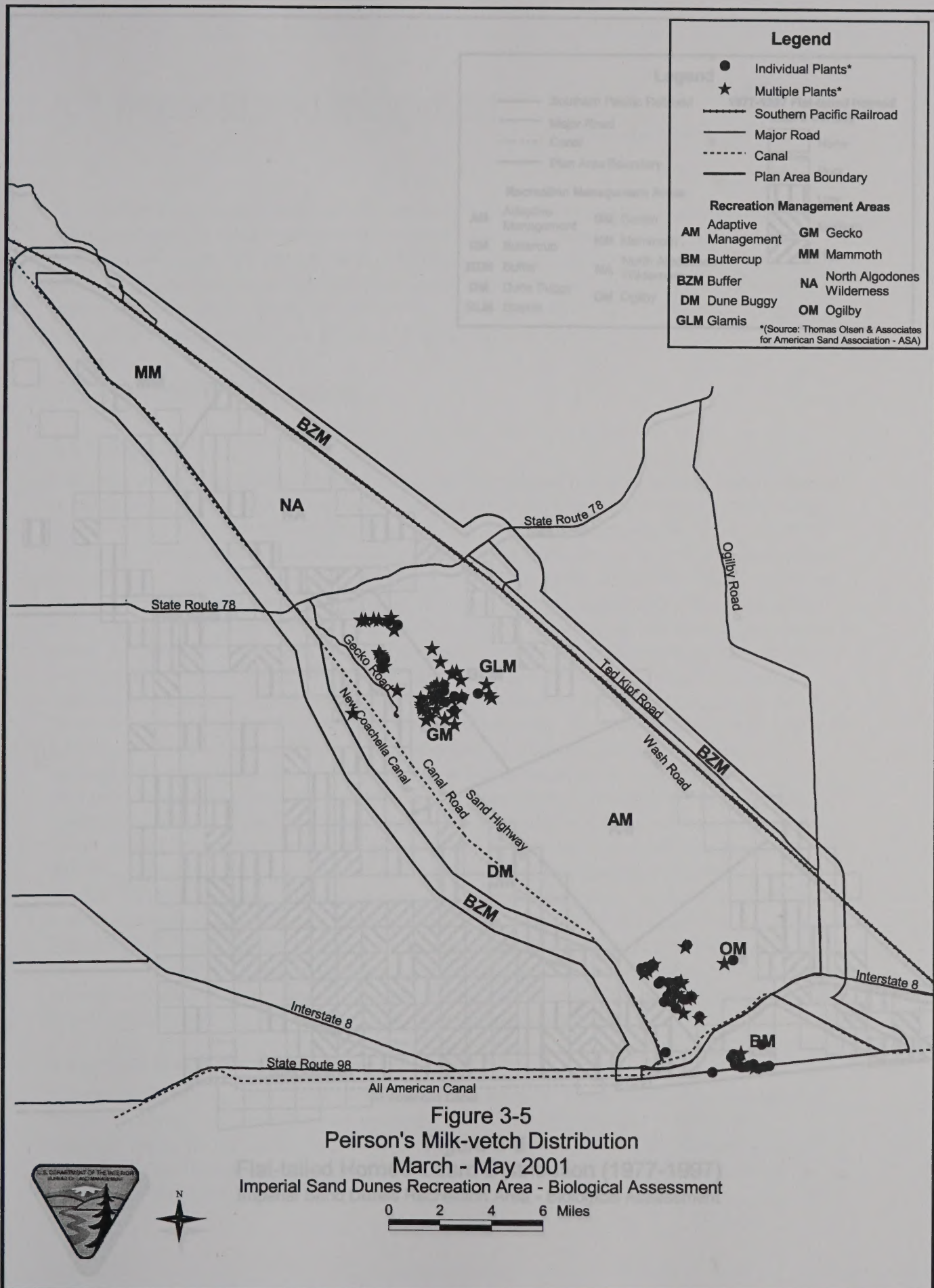








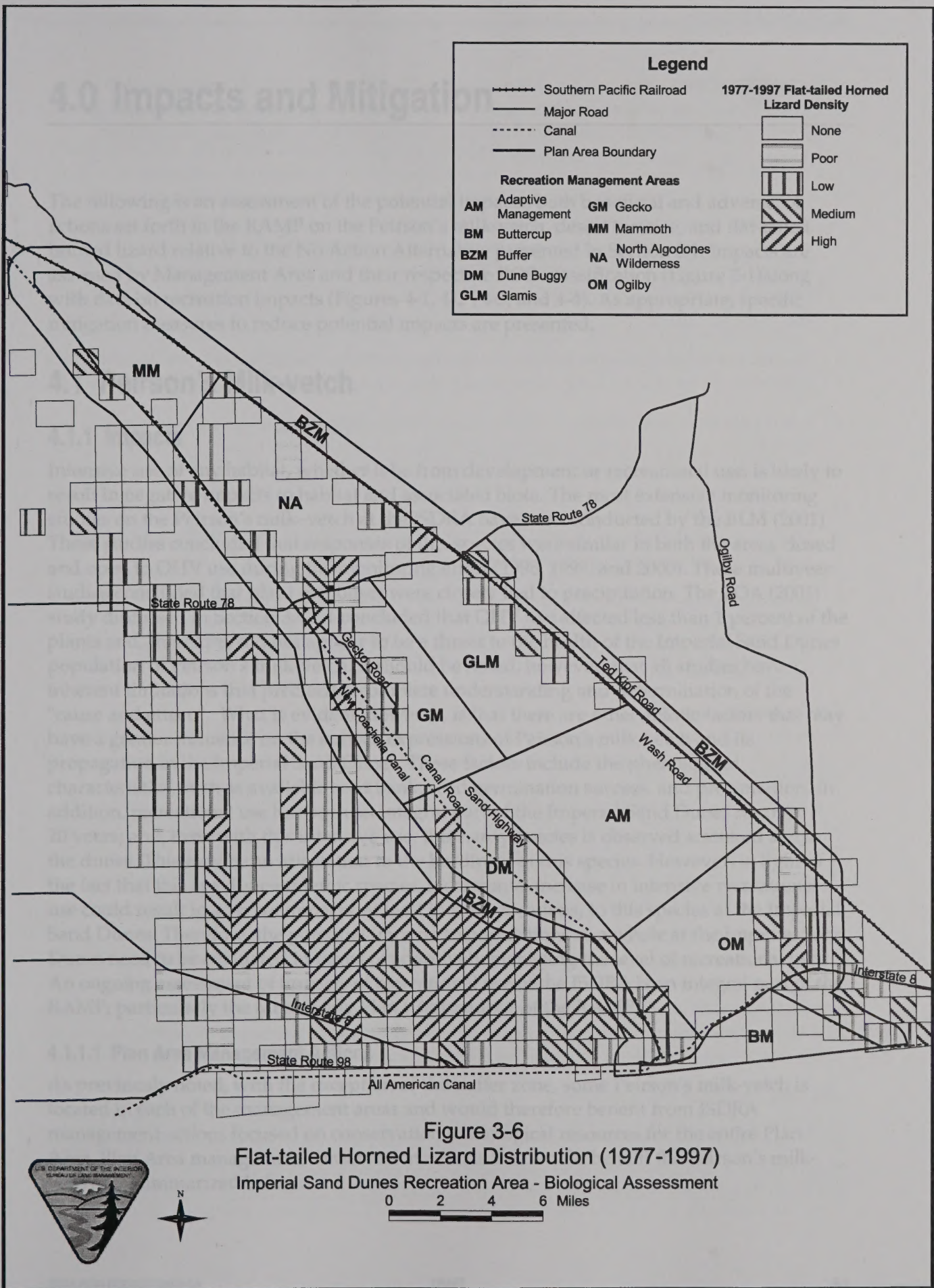


















## 4.0 Impacts and Mitigation

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The following is an assessment of the potential impacts, both beneficial and adverse, of actions set forth in the RAMP on the Peirson's milk-vetch, desert tortoise, and flat-tailed horned lizard relative to the No Action Alternative presented in Section 2.1. Impacts are assessed by Management Area and their respective ROS classification (Figure 2-1) along with data on recreation impacts (Figures 4-1, 4-2, 4-3, and 4-4). As appropriate, specific mitigation measures to reduce potential impacts are presented.

### 4.1 Peirson's Milk-vetch

#### 4.1.1 Impacts

Intensive use of any habitat, whether it be from development or recreational use, is likely to result in negative impacts to habitat and associated biota. The most extensive monitoring studies on the Peirson's milk-vetch at the ISDRA have been conducted by the BLM (2001). These studies concluded that responses of this species were similar in both the areas closed and open to OHV use during the monitoring effort (1998, 1999, and 2000). These multiyear studies concluded that plant responses were closely tied to precipitation. The TOA (2001) study discussed in Section 3.4.2.1 concluded that OHV use affected less than 1 percent of the plants and, therefore, did not appear to be a threat to the health of the Imperial Sand Dunes population of Peirson's milk-vetch. It should be noted, however, that all studies have inherent limitations that preclude a complete understanding and determination of the "cause and effect." What is evident, however, is that there are other abiotic factors that may have a greater influence on the surface expressions of Peirson's milk-vetch and its propagation in the Imperial Sand Dunes. These factors include the phenological characteristics, such as available seed bank, seed germination success, and precipitation. In addition, recreational use has been an integral part of the Imperial Sand Dunes for over 20 years; and, even with this intensive use, this hardy species is observed scattered across the dunes. This may be an attestation to the hardiness of this species. However, in light of the fact that this is a dune-endemic species, incremental increase in intensive recreational use could result in adverse impacts, at least in some locations, to this species at the Imperial Sand Dunes. Therefore, the potential impacts to populations as a whole at the Imperial Sand Dunes need to be evaluated in terms of adaptively managing the level of recreational use. An ongoing assessment of impacts of recreational use of the ISDRA is an integral part of the RAMP, particularly the Monitoring Plan (Appendix 1 of the RAMP).

##### 4.1.1.1 Plan Area Management Actions

As previously noted, with the exception of the buffer zone, some Peirson's milk-vetch is located in each of the management areas and would therefore benefit from ISDRA management actions focused on conservation of biological resources for the entire Plan Area. Plan Area management conservation actions that would benefit the Peirson's milk-vetch are summarized below:



### ***Education Programs***

- The BLM would provide environmental awareness training for all OHV users. The training would identify sensitive biological resources at the Plan Area and address conservation measures to minimize OHV impacts.
- An educational outreach program would be developed to educate OHV users about the biological resources of the Plan Area. The program would focus on Peirson's milk-vetch as well as other special-status species and provide simple effective ways of avoiding or minimizing impacts. Geographic information system (GIS) maps or informational pamphlets about the species and sensitive areas to be avoided also would be a part of the outreach effort.
- In addition to educating to the public visiting the dunes, the BLM staff would provide education beyond the Plan Area to local public schools in Imperial County.
- Interpretive centers/kiosks would be placed in strategic locations near the Ranger Station and campgrounds to educate OHV users about natural resources within the Plan Area. Brochures, informational leaflets, and maps would be available at the interpretive centers.
- To encourage the control of pets, information on the negative impacts of predation on wildlife would be made available to all visitors at the interpretive kiosks.
- Bulletin boards would be installed within the campgrounds. Rules, regulations, and maps would be posted. The maps would identify popular recreation sites, routes, campgrounds, and vendor sites. Speed limits, quiet hours, use of fire pans, etc., would be outlined in the rules.

### ***Controlled OHV Use***

Entry into the Adaptive Management Area would be controlled through use of permits.

### ***No-Camping Buffer Zone***

A 1-mile-wide, no-camping buffer zone would be established around the entire Plan Area. Only designated camping would be allowed within this 1-mile buffer. Appropriate signage placed at strategic locations would indicate where designated camping is allowed. Law enforcement officers would be responsible for ensuring compliance and would cite violators. This action should reduce travel into Peirson's milk-vetch habitat.

### ***Signage to Ensure Compliance with Closed Areas***

Carsonite signs would be used to delineate closed and limited access areas. To ensure that camping activity remains within designated camping areas and routes, each camping pad would be identified with a posted number. These numbered camping sites and access routes would be designated on a map, which would be available to all visitors. Camping and vehicular activity within these areas would be frequently monitored.

### ***GIS Data Collection and Repository***

A centralized GIS data repository would be established for collection and analysis of GIS data pertaining to the entire dunes. The repository would be housed at the BLM El Centro Field Office. The focus of the data collection and analysis would be the Peirson's milk-vetch; however, additional data may be collected to analyze population trends of other special-



status species within the Plan Area. The GIS data would support implementing adaptive management strategies for conserving special-status species.

### ***Preconstruction Siting and Clearance Survey Requirements***

Prior to construction activities, a site suitability analysis would be conducted to locate areas with the least potential impact to biological resources.

### ***Control of Invasive Plants***

BLM would inventory the distribution and abundance of invasive plant species as part of the annual special-status species monitoring program. Preventive measures would include minimization of soil disturbance; closure of unnecessary routes, where possible; limiting the use of construction materials such as gravel, fill, mulch straw, and seed mixes that may carry seeds of invasive plants. Postconstruction monitoring would ensure there is no invasive plant propagation.

#### **4.1.1.2 Mammoth Management Area**

The RAMP identifies this area as ROS Semi-Primitive Motorized reflecting its current recreational use. There are no anticipated changes in OHV-use patterns anticipated in the Mammoth Management Area through implementation of the RAMP. Increases in impacts to Peirson's milk-vetch could result from increased visitor use.

#### **4.1.1.3 North Algodones Dunes Wilderness Management Area**

This area provides 27,087 acres of nearly complete protection for the Peirson's milk-vetch and other biological resources. Increased protection from improved law enforcement and visitor education should further reduce potential impacts to this species from motorized recreation or illegal entry.

#### **4.1.1.4 Gecko Management Area**

This is currently the most developed management area in the ISDRA and will be managed under the ROS Rural classification. Facilities for intensified motorized use and camping already exist. Areas marked for proposed improvement would have not direct impacts on Peirson's milk-vetch in that these area do not currently support the species. Any indirect effects from increased visitor use would be partly offset from proposed increased visitor education resulting from installing kiosks and interpretive areas at Osborne Overlook and near public phones at Gecko Road, Gecko Campground, and Roadrunner Campground.

#### **4.1.1.5 Glamis Management Area**

As is the case with the Gecko Management Area, the Glamis area will be managed as ROS Roaded Natural reflecting its historical use. Proposed facilities improvements are not likely to directly impact the Peirson's milk-vetch. Increases in impacts to Peirson's milk-vetch could result from increased visitor use.

#### **4.1.1.6 Adaptive Management Area**

The Adaptive Management Area encompasses 33,289 acres of the most diverse habitat in the ISDRA along with some of the most suitable habitat and highest abundance of Peirson's milk-vetch (Figure 4-3). This management area will be managed using principles of adaptive management. Adaptive management is a process of implementing policy decisions as



scientifically driven management experiments that test predictions and assumptions in management plans, using the resulting information to improve the plans. It is a mechanism for integrating scientific knowledge and experience for the purpose of understanding and managing natural systems such as the ISDRA ecosystem.

This process allows for the continuous improvement of management policies and practices based on previous outcomes of operational programs. Its most effective form, "active" adaptive management, employs management programs that are designed to experimentally compare selected policies or practices, by evaluating alternative hypotheses about the system being managed (Nyberg, 1998). Adaptive management is a way for managers to proceed responsibly in the face of multiple uncertainties. A simple, effective, six-step process for the ISDRA adaptive management program has been used in developing management actions in the RAMP.

- **Problem assessment:** This involves defining the scope of the management problem as developed through evaluation of issues, concerns, opportunities, desired future conditions, and identification of additional data needs.
- **Design:** This involves the design of management actions to further understand and quantify impacts, thresholds, visitor supply, and levels of acceptable change. This step involves designing a management plan / monitoring program that will provide reliable feedback about the effectiveness of planned actions to meet management objectives. This step should yield information to fill the gaps in understanding (e.g., effects of OHV use on Peirson's milk-vetch) identified during problem assessment.
- **Implementation:** Management actions are implemented to generate knowledge for continuing analysis and evaluation.
- **Monitoring:** In this step, key response indicators are monitored to determine the effectiveness of the management actions.
- **Evaluation:** This involves an analysis of the management outcome, in light of original management objectives.
- **Adjustment:** This is a reassessment of the challenges and an adjustment of management objectives and planned actions, in light of new data developed.

Habitat conservation will be achieved through the classification of a limited access interior dune adaptive management area, characterized by contiguous east-west sensitive-species habitat. The adaptive use area would be accessed via permit. Visitor supply ranges would be established to provide a high quality day-use Semi-Primitive Motorized recreation opportunity for all-terrain vehicle (ATV) and dune buggy enthusiasts, with special chances for small groups of family and friends to enjoy a sense of remoteness and tranquility, the sights and sounds of nature, to learn about sand dune ecology, to explore, to practice good stewardship, and feel inspired by the awe of the ISDRA. This area provides nature-based opportunities where the focus is on experiencing the natural resource and not the power, speed, or other attributes of the motorized conveyance. Periodic modification to the visitor supply range would be determined through professional analysis resulting from data and information compiled during ongoing resource and visitor satisfaction surveys and monitoring programs.



The management objective in the Adaptive Management Area is to provide for high quality, unique world class day-use Semi-Primitive Motorized Recreation Opportunity for ATV, motorcycle, truck and dune buggy activities. The recreation visitor supply for the Adaptive Management Area will be 75 groups (up to 525 vehicles) per day during the visitation season.

Access to the Adaptive Management Area will be by permit only, except for administrative and law enforcement purposes. To obtain a permit, the driver of each vehicle must pass a resource conservation exam. When requesting a permit, each vehicle and driver must be identified. One permit would be valid for one group of up to 7 vehicles for a period of up to 7 days. A day-use period is defined as a period from sunrise to sunset. Reservations and/or multiple reservations could be made in advance. During the first year, all permits will be issued onsite to determine visitor supply needed in the Adaptive Management Area. During subsequent years, a maximum of 70 percent of all permits would be issued by reservation; and 30 percent would be issued in person at the Cahuilla Ranger Station. Should reservations not meet the 70 percent maximum, the balance of permits will be made available at the Cahuilla Ranger Station. Reservations may be made for 1 to 7 days based on availability. Permittees making reservations would receive all materials, including a permit, through the mail. A permit would not be authorized until all signatures and fees have been completed. Each permit issued would include printed environmental education material and a test on sensitive plant and animal species, other sensitive resources, safety materials, and general stipulations for use of the area. A permit holder must sign that he/she has read and understands the printed material and stipulations. A fee would be charged for each permit issued. The fee would be based on cost recovery for the administration of this permit and adaptive area. Cost recovery would be based on, but not limited to, the cost of printing environmental education material related to sensitive species within the Adaptive Management Area, compliance, signing, and monitoring. A business plan would be prepared to determine cost recovery. Each vehicle within a group that is issued a permit would be provided a safety flag that is easily identifiable by BLM from the ground and/or air. Vehicles within the Adaptive Management Area without a permit and BLM-issued safety flag would be issued a citation for being in the area without authorization. Permitted access to the Adaptive Management Area would be allowed through the boundary, except through the microphyll woodlands on the east side of the management area.

To measure the success of the Adaptive Management Area, BLM will establish a biological monitoring program in accordance with Appendix 1 of the RAMP. BLM will establish a visitor satisfaction and demand survey to determine if visitor satisfaction and demand are being met within the boundary area. No facilities will be allowed in the Adaptive Management Area. Interpretive and informational signs may be allowed in conformance with the objectives of the Adaptive Management Area. No commercial services and/or competitive events will be allowed in the Adaptive Management Area.

#### **4.1.1.7 Olgilby Management Area**

The absence of newly proposed road improvements or recreational facilities in this management area represents a direct and indirect benefit to Peirson's milk-vetch. The aggressive outreach programs for habitat conservation and resource protection is a further benefit. The low-to-intense concentration of OHV recreation in this area for families and



groups will likely result in some continued impacts to the species (Figure 4-2); however, managing the area as Road Natural does not represent a potential increase in impacts.

#### **4.1.1.8 Dune Buggy Flats Management Area**

This management area is currently used for camping, OHVs, commercial vending, and rights-of-way. It would be managed under the Road Natural classification of the ROS spectrum reflecting its current use. Improvements such as applying and maintaining dust palliative on the wash road, grading entrance roads, and constructing pit toilets are unlikely to directly impact Peirson's milk-vetch.

#### **4.1.1.9 Buttercup Management Area**

This management area would be managed under the Rural classification under the ROS reflecting its current use for camping, OHV use, sightseeing, commercial vending, education, filming, and rights-of-way. Proposed facilities improvements would be unlikely to directly impact Peirson's milk-vetch population in the area.

#### **4.1.1.10 Buffer Zone Management Area**

The creosote bush scrub of the Buffer Zone does not provide habitat for the Peirson's milk-vetch. However, precluding camping in this area should reduce potential impacts from recreational use on nearby populations.

#### **4.1.1.11 Overall Impacts**

Implementation of the RAMP would have, on balance, beneficial impacts on the Peirson's milk-vetch in the Plan Area relative to Alternative 1. The combined area of the Adaptive Management Area and North Algodones Dunes Wilderness Area afford a high level of protection for the Peirson's milk-vetch. Implementation of the RAMP will enable BLM staff to better conserve and manage the dunes as a conservation area for this species. Also, the majority of the potential direct impacts authorized under various actions would occur in areas not known to support this species (Figure 4-2).

### **4.1.2 Mitigation**

Aside from the conservation efforts that are an integral part of the objectives of the RAMP, standard mitigation measure would be implemented to reduce impacts from construction activities. Prior to implementing any construction activities, a site suitability analysis will be conducted to determine areas with the fewest constraints for siting. These areas may be areas with no to low occurrence of Peirson's milk-vetch and other sensitive species, or areas already supporting high-use activity. The analysis may be supported by conducting a topological overlaying of various GIS data coverages.

The GIS siting analysis will be followed by a presurvey to ground truth the potential siting area. This action will be performed to determine actual occurrence and abundance of Peirson's milk-vetch and other special-status species in this area.

Based on the initial siting analysis, impact avoidance measures may be taken, which may include minimization of project footprint or relocation of the facility in the event of potential impacts to sensitive plants. Presurveys will be performed by qualified biologists and in accordance with accepted protocols and guidelines.



## 4.2 Desert Tortoise

### 4.2.1 Impacts

Desert tortoise are located on the eastern periphery of the Plan Area. The majority of the Plan Area does not support suitable habitat for the desert tortoise. Although tortoises have been observed in the eastern portion of the Plan Area in the microphyll woodland/creosote bush scrub/open desert wash habitats, abundance of tortoise is likely to be very low. However, tortoises would be adversely affected as a result of the OHV activities authorized by the RAMP. Desert tortoise will directly benefit from management actions in the Buffer Zone, particularly the prohibition on camping and increased public awareness of tortoise conservation.

Any localized impacts would be further minimized by proposed mitigation. No activities are planned within the desert tortoise critical habitat; therefore, the proposed actions will not directly affect primary elements of the critical habitat. Potential indirect impacts to desert tortoise or critical habitat will be minimized through restricted access routes through the microphyll woodland/open desert wash areas.

### 4.2.2 Mitigation

Standard mitigation measures for potential impacts to the desert tortoise and its habitat from construction activities are presented below. Although the focus of this conservation strategy is desert tortoise, these same measures are applicable for conservation of other desert reptile species such as flat-tailed horned lizard and fringe-toed lizard.

#### 4.2.2.1 Preconstruction Surveys

Preconstruction surveys would be conducted prior to any ground disturbing activities in suitable desert tortoise habitat to verify no desert tortoise or burrows or both would be impacted. Surveys would be conducted similar to the USFWS protocols and would be conducted by a qualified biologist (USFWS, 1992). A qualified biologist is a professional biologist who has knowledge about the biology and ecology of the desert tortoise and has demonstrated experience with the desert tortoise. This includes experience in techniques to locate and handle tortoises and inventory of desert tortoise habitat. Desert tortoise handling will follow the guidelines provided in *Guidelines for Handling Desert Tortoises During Construction Projects* (Desert Tortoise Council, 1994). Preconstruction surveys would be conducted within 24 hours of initiation of construction activity, to clear the construction area of tortoises or burrows. If a tortoise or tortoise sign is found during the preconstruction surveys, the USFWS, CDFG, and BLM would be notified within 24 hours.

#### 4.2.2.2 Mitigation Measures During Construction Phase

Prior to onset of construction, the construction area would be clearly marked or flagged along the project boundaries. Construction crews would be instructed to confine activities to flagged or marked areas. No paint or permanent discoloring agents would be applied to rocks or vegetation to indicate survey or construction activity limits.



A qualified biologist will conduct a full-coverage presurvey and zone of influence transects for the construction footprint. The presurvey would be performed within 24 hours of the onset of construction activities.

Those tortoise burrows located within the Plan Area that cannot be avoided would be excavated by hand during this phase. All excavations of burrows would be in accordance with desert tortoise handling procedures specified by the USFWS and under authorization of CDFG and USFWS. Measures would also be taken to prevent tortoises from reoccupying the burrow sites affected by construction. Burrows would be excavated, and any handling of tortoises would be accomplished by authorized biologists.

All tortoises found within the construction area, whether aboveground, in excavated burrows, or found in open trenches, would be placed 300 to 1,000 feet outside the immediate construction footprint. Tortoises would be relocated by the authorized biologist in compliance with the Desert Tortoise Guidelines produced by the Desert Tortoise Council (1990) Appendix 7.

Open trenches would be constructed with suitable egress at either end to allow wildlife to escape. Open trenches within potential tortoise habitat would be inspected periodically throughout the day. Trenches would be inspected immediately prior to backfilling by a qualified biologist.

All construction-vehicle movement outside the construction areas would be restricted to predesignated access or public roads. Overnight parking and storage of equipment and material would be in previously disturbed areas (i.e., lacking vegetation). These areas would also be designated by the preconstruction survey team.

Construction workers would strictly limit their activities and vehicles to construction areas and routes of travel that have been flagged to eliminate adverse impacts to desert tortoises and their habitat. Aside from these areas, workers may not drive cross-country even within the right-of-way. All workers would be instructed that their activities are restricted to flagged and cleared areas.

Hazardous materials would not be drained onto the ground or into streams or drainage areas. Totally enclosed containment would be provided for all trash. All construction waste including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials would be removed to a disposal facility authorized to accept such materials. Totally enclosed, raven-proof containment would be provided for all trash.

To prevent mortality, injury, and harassment of desert tortoises and damage to their burrow, pets would be confined or leashed.

No widening or upgrading of existing access roads would be undertaken in the area of construction, except for repairs necessary to make roads passable. There would be no blading of new access roads.



## 4.3 Flat-tailed Horned Lizard

### 4.3.1 Impacts

The majority of use by OHV use is well removed from areas known to support a high abundance of these species (Figure 4-4). However, flat-tailed horned lizards would be adversely affected by the motorized OHV activities authorized by the RAMP. The Plan Area contains approximately 113 cells occupied by flat-tailed horned lizards. The North Algodones Dunes Wilderness Area would provide full protection for 17 occupied cells (15 percent of the total) within the Plan area. The Adaptive Management Area would provide limited protection for 28 occupied cells (25 percent of the total) containing flat-tailed horned lizard. Areas with no specific protection encompass 67 occupied cells (60 percent of the total) within the Plan Area.

The Buffer Zone Management Area management actions established in the RAMP will be effective in reducing impacts to this species, particularly the no camping zone. The monitoring will at least answer questions concerning whether psammophytic scrub supports many flat-tailed horned lizards and, if so, clarify the distribution of flat-tailed horned lizard in the Plan Area (described in detail in Appendix 1 of the RAMP). Any localized direct impacts will be further minimized by preconstruction siting analysis, preconstruction surveys, and construction-phase monitoring identified for desert tortoise in this Biological Assessment as well as in *The Flat-tailed Horned Lizard Rangewide Management Strategy* (Foreman, 1997).

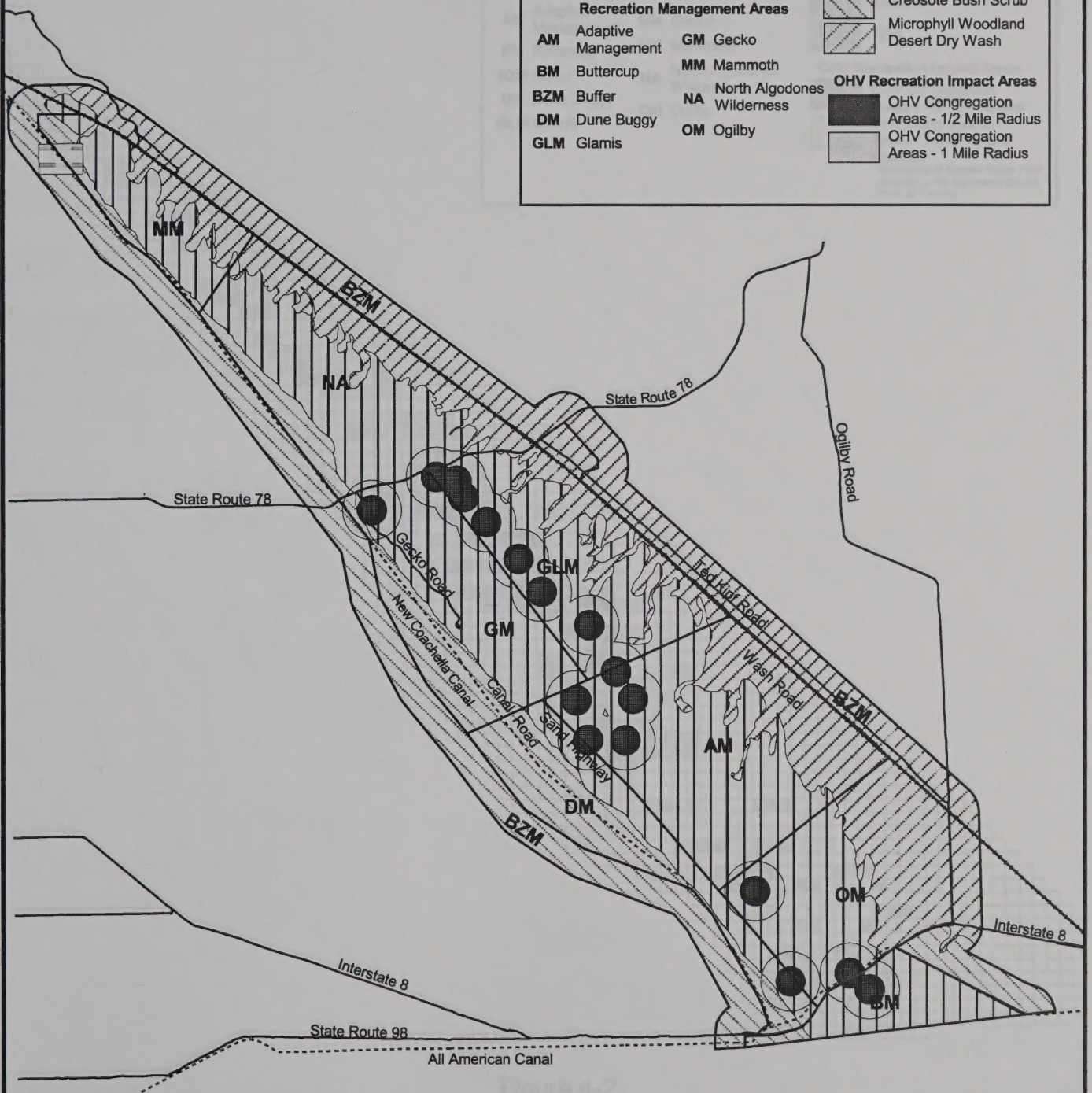
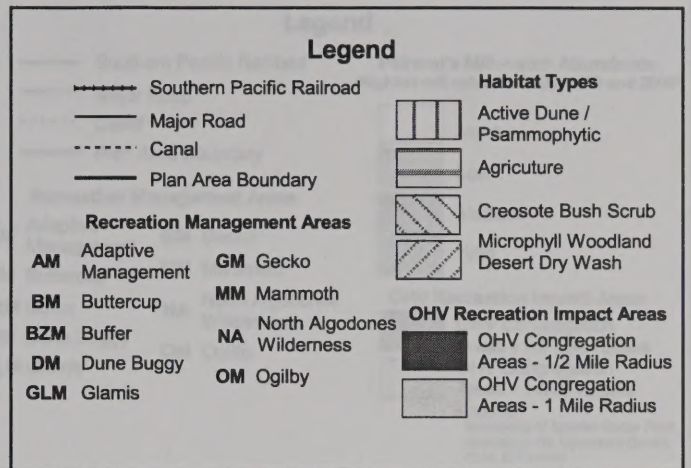
### 4.3.2 Mitigation

The flat-tailed horned lizard is also afforded protection through *The Flat-tailed Horned Lizard Rangewide Management Strategy* (Foreman, 1997). This document was prepared to provide guidance for the conservation and management of sufficient habitat to maintain viable populations of this species. The management strategy was prepared by representatives from federal, state, and local governments and designed to be used as the basis for a conservation agreement among the agencies. Surface disturbing activities are limited in the management areas identified in the strategy. Land alterations outside of these management areas are not be restricted, but special mitigation and compensation measures would be applied. These measures are applicable to the Plan Area.









**Figure 4-1**  
**Recreation Impact Areas and Habitat Types**  
 Imperial Sand Dunes Recreation Area - Biological Assessment

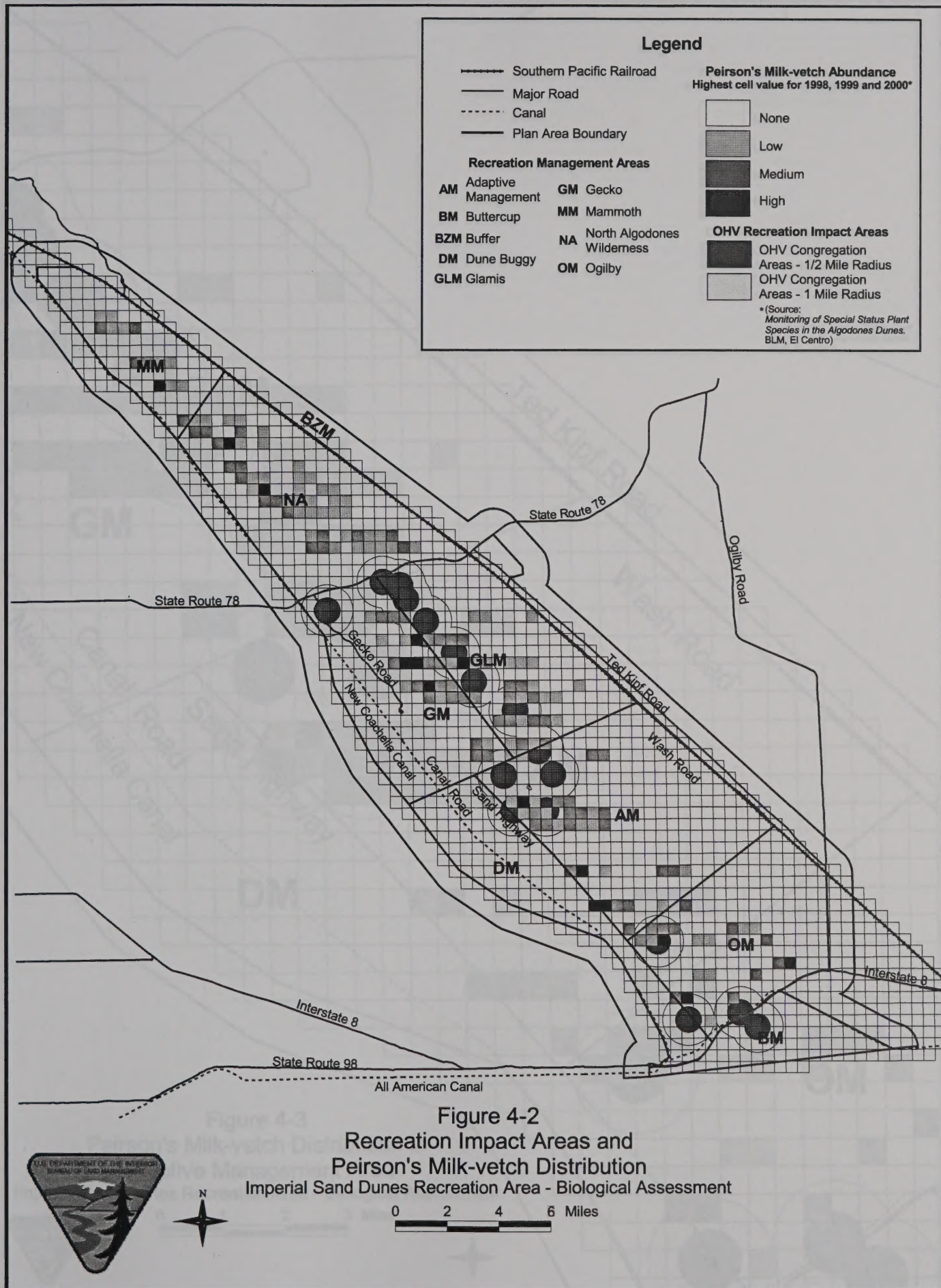


0 2 4 6 Miles





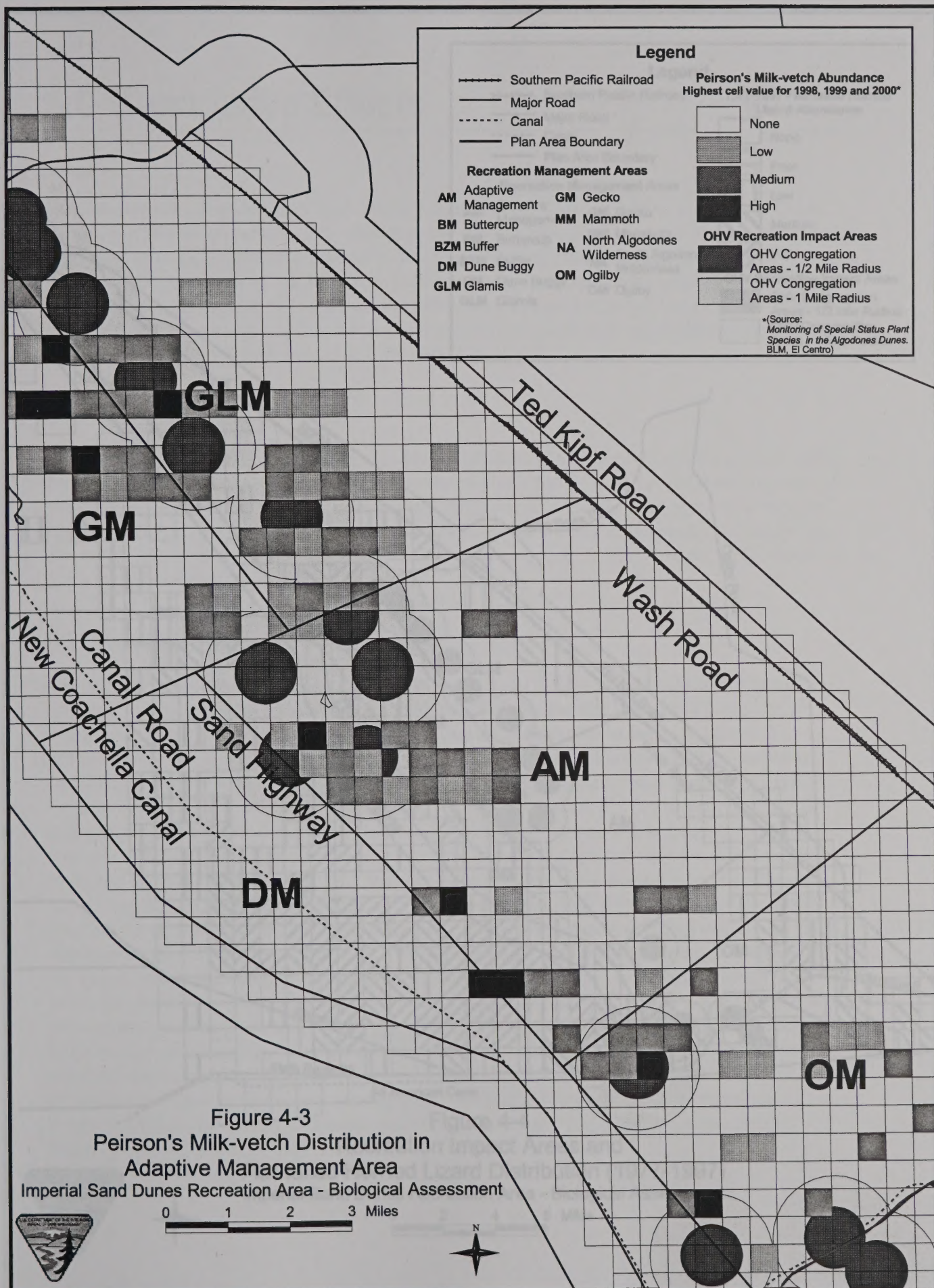










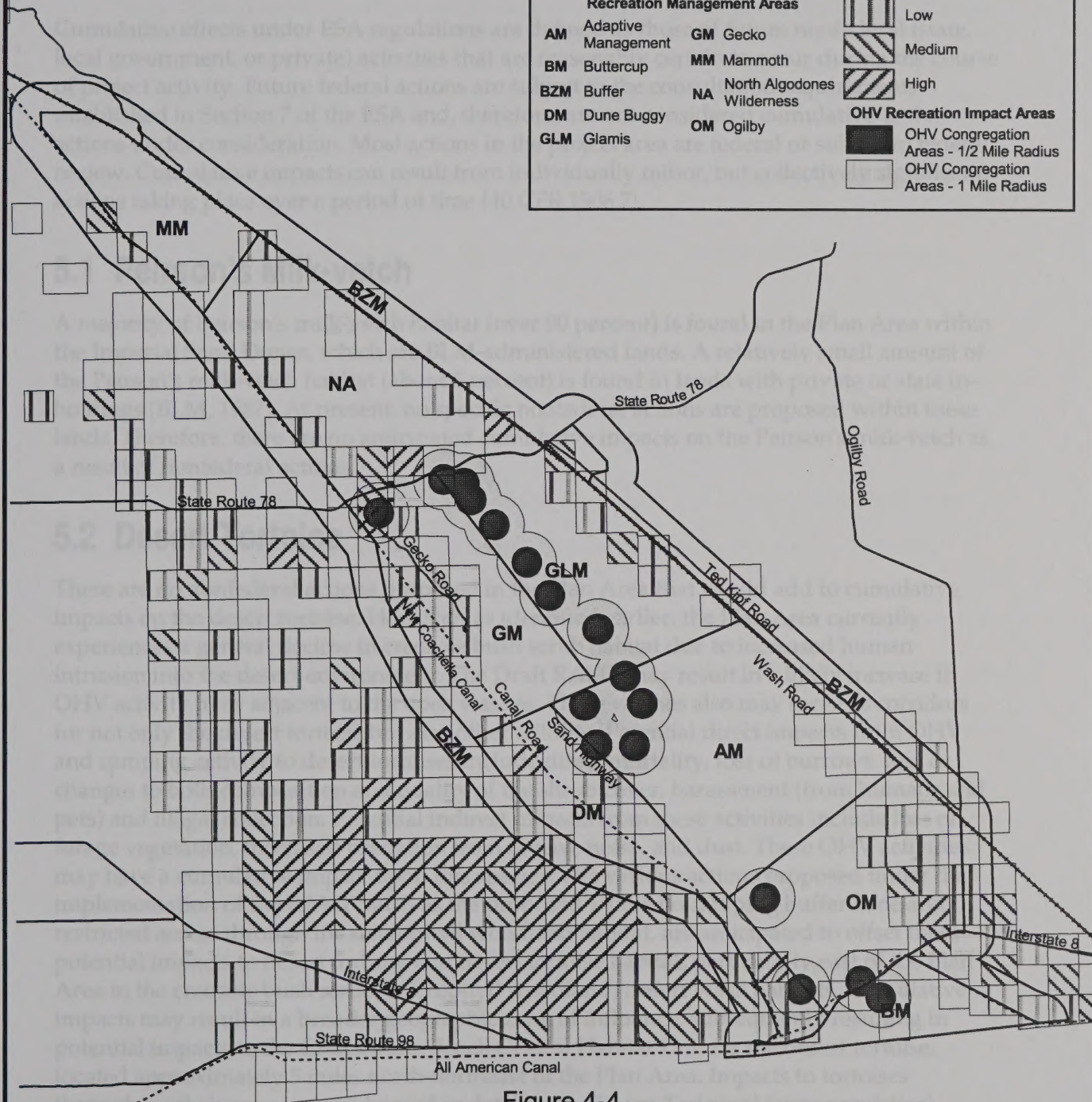








# 5.0 Cumulative Effects



**Figure 4-4**  
**Recreation Impact Areas and**  
**Flat-tailed Horned Lizard Distribution (1977-1997)**  
**Imperial Sand Dunes Recreation Area - Biological Assessment**



0 2 4 6 Miles







## 5.0 Cumulative Effects

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Cumulative effects under ESA regulations are defined as those of future nonfederal (state, local government, or private) activities that are reasonably certain to occur during the course of project activity. Future federal actions are subject to the consultation requirements established in Section 7 of the ESA and, therefore, are not considered cumulative to the actions under consideration. Most actions in the project area are federal or subject to federal review. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time (40 CFR 1508.7).

### 5.1 Peirson's Milk-vetch

A majority of Peirson's milk-vetch habitat (over 90 percent) is found in the Plan Area within the Imperial Sand Dunes, which are BLM-administered lands. A relatively small amount of the Peirson's milk-vetch habitat (about 5 percent) is found in lands with private or state in-holdings (BLM, 1987). At present, no specific nonfederal actions are proposed within these lands. Therefore, there are no anticipated cumulative impacts on the Peirson's milk-vetch as a result of nonfederal actions.

### 5.2 Desert Tortoise

There are no nonfederal actions proposed in the Plan Area that would add to cumulative impacts on the desert tortoise. However, as identified earlier, the Plan Area currently experiences a general decline in creosote bush scrub habitat due to increased human intrusion into the desert environment. The Draft RAMP may result in a likely increase in OHV activity in or adjacent to the open washes. These washes also may serve as corridors for not only the desert tortoise but also other wildlife. Potential direct impacts from OHV and camping activity to desert tortoises include direct mortality, loss of burrows, loss or changes to both composition and quality of the shrub cover, harassment (from humans and pets) and illegal collection. Potential indirect impacts from these activities include loss of forage vegetation, increased predation from ravens, noise, and dust. These OHV activities may have a cumulative impact upon this species. The various actions proposed under the implementation of the RAMP, such as the proposed 1-mile no camping buffer zone and restricted access through the microphyll woodland habitat, are anticipated to offset these potential impacts to desert tortoise and desert tortoise habitat, particularly east of the Plan Area in the creosote bush scrub/microphyll woodland/desert wash habitats. Cumulative impacts may result in a broader geographic zone of influence, subsequently resulting in potential impacts to the Chuckwalla Bench Critical Habitat Unit for the desert tortoise, located approximately 5 miles north-northeast of the Plan Area. Impacts to tortoises throughout their range are addressed in detail in the *Desert Tortoise (Mojave population) Recovery Plan* (USFWS 1994a).



## 5.3 Flat-tailed Horned Lizard

The most suitable habitat for the flat-tailed horned lizards outside the Imperial Sand Dunes is found in the southwest corner of the Plan Area, in the East Mesa ACEC. There are no specific nonfederal actions proposed in this area that would impact flat-tailed horned lizards. However, this area is currently subjected to existing OHV recreational activity, canal, pipeline, and road maintenance that may result in direct and indirect impacts to flat-tailed horned lizards. As identified for the desert tortoise cumulative impacts, the implementation of the proposed RAMP may compound the impacts to flat-tailed horned lizards within the ACEC through increased OHV and camping activity. However, the *Flat-tailed Horned Lizard Rangewide Management Strategy* and designation of a 1-mile no-camping zone buffer are anticipated to minimize these potential impacts.



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Appendix A  
Plant and Wildlife Species Potentially  
Occurring Within the Plan Area















## Plant and Wildlife Species Potentially Occurring Within the Plan Area

Common Name	Scientific Name	Status
<b>Plants</b>		
Algodones Dunes sunflower	<i>Helianthus niveus ssp. tephrodes</i>	BLM/FWS/SE/CNPS-1B
Arrow weed	<i>Pluchea sericea</i>	
Big galleta	<i>Hilaria rigida</i>	
Birdcage evening-primrose	<i>Oenothera deltoidea</i>	
Borrogo milk-vetch	<i>Astragalus lentiginosus var. borreganus</i>	CNPS-4
Brittlebush	<i>Encelia farinosa</i>	
Brown plume wirelettuce	<i>Stephanomeria pauciflora</i>	
Burrobush	<i>Ambrosia dumosa</i>	
Cheeseweed	<i>Hymenoclea salsola</i>	
California ditaxis	<i>Ditaxis californica</i>	BLM/FWS/CNPS-1B
California threeawn	<i>Aristida californica</i>	
Carrizo mallow	<i>Sphaeralcea orcuttii</i>	
Cattails	<i>Typha spp.</i>	
Common sandpaper plant	<i>Petlonyx thurberi</i>	
Common sunflower	<i>Helianthus annuus</i>	
Coulter's lyrebird	<i>Lyrocarpa coulteri var. palmeri</i>	BLM/CNPS-4
Creosote bush	<i>Larrea tridentata</i>	
Crown-of-thorns	<i>Koebeslina spinosa</i>	CNPS-2
Desert buckwheat	<i>Eriogonum deserticola</i>	
Desert dicoria	<i>Dicoria canescens</i>	
Desert lily	<i>Hesperocallis undulata</i>	
Desert panicum	<i>Panicum urvilleanum</i>	
Desert starvine	<i>Brandegea bigelovii</i>	
Desert thorn-apple	<i>Datura discolor</i>	
Desert unicorn plant	<i>Proboscidea altheaefolia</i>	CNPS-4
Desert willow	<i>Chilopsis linearis</i>	
Dyebush	<i>Dalea emoryi</i>	
Fairy duster	<i>Calliandra eriophylla</i>	CNPS-2
False daisy	<i>Eclipta alba</i>	
Fennel-leaf pondweed	<i>Potamogeton pectinatus</i>	
Foxtail cactus	<i>Escobaria vivipara var. alversonii</i>	BLM/FWS/CNPS-1B
Giant reed	<i>Arundo donax</i>	
Giant spanish needle	<i>Palafoxia arida var. gigantea</i>	BLM/FWS/CNPS-1B
Glandular ditaxis	<i>Ditaxis clariana</i>	CNPS-2
Hairy stickleaf	<i>Mentzelia hirsutissima</i>	FWS/CNPS-2
Hardwood's milk-vetch	<i>Astragalus insularis</i>	CNPS-4
Honey mesquite	<i>Prosopis glandulosa</i>	
Horseweed	<i>Conyza canadensis</i>	
Ironwood	<i>Olneya tesota</i>	
Lineleaf white puff	<i>Oligomeris linifolia</i>	
Longleaf jointfir	<i>Ephedra trifurca</i>	
Mediterranean grass	<i>Schismus barbatus</i>	
Mormon tea	<i>Ephedra viridis</i>	
Munz's cholla	<i>Opuntia munzii</i>	BLM/FWS/CNPS-1B
Orocopia sage	<i>Salvia greataei</i>	BLM/FWS/CNPS-1B



## Plant and Wildlife Species Potentially Occurring Within the Plan Area

Common Name	Scientific Name	Status
Palmer's crinklemat	<i>Tiquilia palmeri</i>	
Palo verde	<i>Cercidium floridum</i>	
Peirson's milk-vetch	<i>Astragalus magdalenae</i> var. <i>peirsonii</i>	BLM/FPE/SE/CNPS-1B
Plicate coldenia	<i>Tiquilia plicata</i>	
Ribbed cryptantha	<i>Cryptantha costata</i>	CNPS-4
Rock nettle	<i>Eucnida rupestris</i>	CNPS-2
Rush milkweed	<i>Asclepias subulata</i>	
Sand food	<i>Pholisma sonora</i>	BLM/CNPS-1B
Shortspike watermilfoil	<i>Myriophyllum exalbescens</i>	
Small-flowered tamarisk	<i>Tamarix parviflora</i>	
Smoke tree	<i>Psoralea argemone</i>	
Spiny chloracantha	<i>Aster spinosus</i>	
Spotted cadythumb	<i>Polygonum fusiforme</i>	
Thurber's pilostyles	<i>Pilostyles thurberi</i>	CNPS-4
Verdin	<i>Auriparus subulata</i>	
White sweetclover	<i>Melilotus albus</i>	
Wiggin's cholla	<i>Opuntia wigginsii</i>	BLM/FWS/CNPS-3
Wiggin's croton	<i>Croton wigginsii</i>	BLM/FWS/SR/CNPS-3
Winged cryptantha	<i>Cryptantha holoptera</i>	CNPS-4
Woolly desert marigold	<i>Baileya pleniradiata</i>	
<b>Wildlife</b>		
American badger	<i>Taxidea taxa</i>	
American coots	<i>Fulica americana</i>	
American kestrel	<i>Falco sparverius</i>	
Andrew's dune scarab beetle	<i>Psuedocotalapa andrewsi</i>	BLM/FWS
Antelope ground squirrel	<i>Ammospermophilus leucurus</i>	
Arizona bell's vireo	<i>Pireo bellii arizonae</i>	BLM/SE
Arizona southwestern toad	<i>Bufo microscaphus microscaphus</i>	BLM/FWS
Barn owl	<i>Tyto alba</i>	
Big brown bat	<i>Eptesicus fuscus</i>	
Black tern	<i>Coalitionist niger</i>	BLM/FWS
Black-tailed gnatcatcher	<i>Poliophtila melanura</i>	
Black-tailed jackrabbit	<i>Lepus californicus</i>	
Black-tailed jackrabbit	<i>Lepus californicus</i>	
Black-throated sparrow	<i>Amphispiza bilineata</i>	
Brow-tassel weevil	<i>Trigonoscutea brunnotasselata</i>	BLM/FWS
Burrowing owl	<i>Athene cunicularia</i>	BLM/FWS
Cactus wren	<i>Campylorhynchus burnnecapillus</i>	
California black rail	<i>Laterallus jamaicensis coturniculus</i>	BLM/FWS/ST
California leaf-nosed bat	<i>Macrotus californicus</i>	BLM/FWS
Carlson's dune beetle	<i>Anomala carlsoni</i>	
Cave myotis	<i>Myotis velifer</i>	BLM
Cheeseweed owlfly	<i>Oliarves clara</i>	BLM/FWS
Chuckwalla	<i>Sauromalus obesus</i>	BLM/FWS
Cliff swallow	<i>Hirundo pyrrhonota</i>	
Colorado desert fringe-toed lizard	<i>Uma notata notata</i>	BLM/FWS



## Plant and Wildlife Species Potentially Occurring Within the Plan Area

Common Name	Scientific Name	Status
Colorado river cotton rat	<i>Sigmodon arizonae plenus</i>	BLM/FWS
Common yellowthroat	<i>Geothlypis trichas</i>	
Couch's spadefoot toad	<i>Scaphiopus couchi</i>	BLM/FWS
Coyote	<i>Canis latrans</i>	
Crissal thrasher	<i>Toxostoma dorsale</i>	
Desert cottontail	<i>Sylvilagus audubonii</i>	
Desert Iguana	<i>Dipsosaurus dorsalis</i>	
Desert kangaroo rat	<i>Dipodomys deserti</i>	
Desert pallid bat	<i>Antrozous pallidus pallidus</i>	
Desert tortoise	<i>Gopherus agassizii</i>	BLM/FT/ST
Desert woodrat	<i>Neotoma lepida</i>	
Ferruginous hawk	<i>Buteo regalis</i>	BLM/FWS
Flat tailed horned lizard	<i>Phrynosoma mcallii</i>	BLM
Gambel's quail	<i>Lophortyx gambelli</i>	
Gila woodpecker	<i>Melanerpes uropygialis</i>	BLM/FWS/SE
Gilded northern flicker	<i>Colaptes auratus chrysoides</i>	
Golden eagle	<i>Aquila chrysaetos</i>	
Great horned owl	<i>Bubo virginianus</i>	
Greater western mastiff bat	<i>Eumops porotis californicus</i>	BLM/FWS
Hardy's dune beetle	<i>Anomala hardyorum</i>	
House finch	<i>Carpodacus mexicanus</i>	
Kit fox	<i>Vulpes macrotis</i>	
Ladder backed woodpecker	<i>Picoides scalaris</i>	
Large-billed savannah sparrow	<i>Passerculus sanwicensis rostratus</i>	BLM/FWS
LeConte's thrasher	<i>Toxostoma lecontei</i>	
Lesser nighthawk	<i>Chordeiles acutipennis</i>	
Loggerhead shrike	<i>Lanius ludovicianus</i>	BLM/FWS
Long-eared owl	<i>Asio otus</i>	
Marsh wren	<i>Cistothorus palustris</i>	
Merlin	<i>Falco columbarius</i>	BLM/FWS
Merriam kangaroo rat	<i>Dipodomys merriami</i>	
Mountain plover	<i>Charadrius montanus</i>	BLM/FWS
Mourning dove	<i>Zenaida macroura</i>	
Mule deer	<i>Odocoileus hemionus</i>	
Northern harrier	<i>Circus cyaneus</i>	
Occult little brown bat	<i>Myotis lucifugus occultism</i>	BLM/FWS
Peregrine falcon	<i>Falco peregrinus</i>	BLM/FWS/FE/SE
Prairie falcon	<i>Falco mexicanus</i>	
Red-tailed hawk	<i>Buteo jamaicensis</i>	
red-wing blackbird	<i>Agelaius phoeniceus</i>	
Rosy boa	<i>Lichanura trivirgata</i>	BLM/FWS
Roundtail ground squirrel	<i>Spermophilus tereticaudus</i>	
Say's phoebe	<i>Sayornis saya</i>	
Sharp-shinned hawk	<i>Accipiter striatus</i>	
Side blotched lizard	<i>Uta stansburiana</i>	
Sidewinder rattlesnake	<i>Crotalus cerastes</i>	



## Plant and Wildlife Species Potentially Occurring Within the Plan Area

Common Name	Scientific Name	Status
Small-footed myotis	<i>Myotis ciliolabrum</i>	BLM
Southwestern willow flycatcher	<i>Empidonax trailii extimus</i>	BLM/FPE/SE
Spadefoot toad	<i>Scaphiopus couchi</i>	BLM/FWS
Spotted bat	<i>Euderma maculatum</i>	BLM/FWS
Townsend's big-eared bat	<i>Plecotus townsendii</i>	BLM/FWS
Turkey vulture	<i>Cathartes aura</i>	
Vaux's swift	<i>Chaetura vauxi</i>	
Verdin	<i>Auriparus subulata</i>	
Warbling vireo	<i>Vireo gilvus</i>	
Western flycatcher	<i>Empidonax difficilis</i>	
Western least bittern	<i>Lxobrychus exilis hasperus</i>	BLM/FWS
Western pipistrelle bat	<i>Pipistrellus hesperus</i>	
Western screech-owl	<i>Otus kennicottii</i>	
Western whiptail lizard	<i>Cnemidophorus tigris</i>	
Western yellow billed cuckoo	<i>Coccyzus americanus occidentalis</i>	SE
White crowned sparrow	<i>Zonotrichia leucophrys</i>	
White rhatany	<i>Krameria grayi</i>	
White-faced ibis	<i>Plegadis chichi</i>	BLM/FWS
White-throated woodrat	<i>Neotoma albigula venusta</i>	BLM/FWS
Wild burro	<i>Equus asinus</i>	
Wilson's warbler	<i>Wilsonia pusilla</i>	
Yavapai leopard frog	<i>Rana yavapaiensis</i>	BLM/USFWS
Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>	
Yellow-rumped warbler	<i>Dendroica coronata</i>	
Yuma clapper rail	<i>Rallus longirostris yumanensis</i>	BLM/FE/SE
Yuma hispid cotton rat	<i>Sigmodon hispidus eremicus</i>	BLM/FWS
Yuma myotis	<i>Myotis yumanensis</i>	BLM
Yuma puma	<i>Felis concolor browni</i>	BLM/FWS
Zebra tailed lizard	<i>Callisaurus draconoides</i>	

## Legend:

BLM: Designated a sensitive species by the U.S. Bureau of Land Management

FWS: Designated as a Special Status by the U.S. Fish and Wildlife Service

FE: Federal listed as endangered

FT: Federal listed as threatened

FTE: Federal proposed for threatened status

FPE: Federal proposed for endangered species

SE: California state listed as endangered

ST: California state listed as threatened

SR: California state rare species

CNPS: California Native Plant Society;

1B – Taxa determined to be rare, threatened, or endangered;

2 – Species rare or endangered in California but common elsewhere;

3 – More information on status needed;

4 – Species of limited distribution.



## Appendix C

Appendix C summarizes the methodologies used to conduct the criteria pollutant air quality impact analysis to support the Draft EIS for the ISORA. This appendix describes criteria pollutant emission estimation data and assumptions used in the analysis.

### Emission Calculation Methodology

As discussed in Section 4.11 of the Draft EIS, Air Quality, this impact analysis involved separate evaluations of criteria pollutant emission analysis for the following six scenarios:

- Existing Conditions – Year 1999 – 2000
- Future Baseline – Year 2012 – 2013
- Alternative 1 – Year 2012 – 2013
- Alternative 2 – Year 2012 – 2013
- Alternative 3 – Year 2012 – 2013
- Alternative 4 – Year 2012 – 2013

Emission inventories were developed for On-road Vehicle emission sources (automobile and recreational vehicles), and for Off Highway Vehicle (OHV)-related emission sources (motorcycle and other off terrain vehicles).

Developing the emission inventories involved considerable data collection, to accurately reflect the existing and proposed levels of activity at the project site and the specific emission sources that would be involved.

Specific information used to calculate emissions included:

- Number and type of vehicle (quantity)
- Vehicle usage rates (hours per day)
- Number of annual and peak weekend vehicle trips
- Average speed of all vehicles
- Vehicle miles traveled (VMT) by vehicle type

The number of vehicles was estimated based on visitor activities for the ISORA, as shown in Section 2. The most current motor vehicle emission factors were derived from the California Air Resources Board (ARB) Motor Vehicle Emission Inventory (MVEI) models EMFAC02 and MVEI03VTC (<http://apc.arb.ca.gov/mve/mveq/mveq.shtml>). OHV factors were derived from information available in the U.S. EPA's 1991 Nonroad Motor Vehicle Emission Study, U.S. EPA emission factors from AP-42, Construction Equipment Emission Factors, as well as emission factors included in SCAQMD CEQA Air Quality Handbook (1993). Total emissions, in terms of tons per year and pounds per day that would be generated during the calendar year and peak daily weekend periods were quantified.

## APPENDIX C AIR QUALITY DATA







# Appendix C

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Appendix C summarizes the methodologies used to conduct the criteria pollutant air quality impact analysis to support the Draft EIS for the ISDRA. This appendix describes criteria pollutant emission estimation data and assumptions used in the analysis.

## Emission Calculation Methodology

As discussed in Section 4.11 of the Draft EIS, Air Quality, this impact analysis involved separate evaluations of criteria pollutant emission analysis for the following six scenarios:

- Existing Conditions – Year 1999 - 2000
- Future Baseline – Year 2012 – 2013
- Alternative 1 – Year 2012 – 2013
- Alternative 2 – Year 2012 – 2013
- Alternative 3 – Year 2012 – 2013
- Alternative 4 – Year 2012 – 2013

Emission inventories were developed for On-road Vehicle emission sources (automobile and recreational vehicles), and for Off Highway Vehicle (OHV)-related emission sources (motorcycle and other all-terrain vehicles).

Developing the emission inventories involved considerable data collection, to accurately reflect the existing and proposed levels of activity at the project site and the specific emission sources that would be involved.

Specific information used to calculate emissions included:

- Number and type of vehicle (quantity)
- Vehicle usage rates (hours per day)
- Number of annual and peak weekend visitors onsite
- Average speed of all vehicles
- Vehicle miles traveled (VMT) by vehicle type

The number of vehicles was estimated based on visitor activities for the ISDRA, as shown in Section 2. The most current motor vehicle emission factors were derived from the California Air Resources Board (ARB) Motor Vehicle Emission Inventory (MVEI) models EMFAC7G and BURDEN 7G (<http://www.arb.ca.gov/msei/mvei/mvdocs.htm>). OHV emission factors were derived from information available in the U.S. EPA's 1991 *Non-road Engine and Vehicle Emission Study*, U.S. EPA emission factors from AP-42, *Compilation of Air Pollutant Emission Factors*, as well as emission factors included in SCAQMD CEQA Air Quality Handbook (1993). Total emissions in terms of tons per year and pounds per day that would be generated during the calendar year and peak daily weekend periods were quantified.



Fugitive dust sources include paved and unpaved road-entrained dust. Emissions from these sources were quantified using emissions factors from the *Compilation of Air Pollutant Emission Factors* (AP-42), SCAQMD CEQA Air Quality Handbook and available documentation addressing fugitive dust. Detailed emission calculation spreadsheets and estimated total construction emissions are provided below.

## Emission Calculation Methodology

As discussed in Section 4.1.1 of the Draft EIS, Air Quality, this impact analysis provides separate estimates of criteria pollutant emissions for the following categories:

- Existing Conditions – Year 1999 – 2000
- Future Baseline – Year 2012 – 2013
- Alternative 1 – Year 2012 – 2013
- Alternative 2 – Year 2012 – 2013
- Alternative 3 – Year 2012 – 2013
- Alternative 4 – Year 2012 – 2013

Emission estimates were developed for On-road Vehicle Emissions sources (automobiles and motorcycles) and for Off-Highway Vehicles (OHV) related emission sources (motorcycles and other off-road vehicles).

Developing the emission estimates involved considerable data collection to accurately reflect the existing and proposed levels of activity at the project site and the specific emission sources that would be involved.

Specific information used to calculate emissions included:

- Number and type of vehicles (quantity)
- Vehicle usage rates (events per day)
- Number of travel and peak weekend vehicle counts
- Average speed of all vehicles
- Vehicle miles traveled (VMT) by vehicle type

The number of vehicles was estimated based on visitor activities for the EIR, as shown in Section 2. The most current motor vehicle emission factors were derived from the California Air Resources Board (CARB) Motor Vehicle Emission Inventory (MVEI) models BAIIA/CII and BUREN/CI (California Air Resources Board, 2008). The CARB MVEI models BAIIA/CII and BUREN/CI are based on information available in the U.S. EPA's 1991 Revised Exhaust Emission Factors (Emission Factors) and AP-42 Compilation of Air Pollution Emission Factors, as well as emission factors included in SCAQMD CEQA Air Quality Handbook (1997). Total emissions in terms of tons per year and pounds per day were calculated by multiplying the calendar year and peak daily weekend pounds were quantified.



Existing Condition	Number of Vehicle Trips		
	OHV Use	Other Use	Total
Annual Vehicle Trips	446,274	49,586	495,860
Peak Day Vehicle Trips			
Halloween	9,378	1,042	10,420
Thanksgiving	16,065	1,785	17,850
New Year	10,710	1,190	11,900
Martin Luther King's Birthday	6,696	744	7,440
President's Day	13,383	1,487	14,870
Easter	10,710	1,190	11,900

#### Summary of Estimated Annual Emissions

(1999-2000)	CO	ROG	NOx	SOx	PM10
Annual Vehicle Trips	tons/year	tons/year	tons/year	tons/year	tons/year
Existing Condition					
On Road	75.35	23.60	25.39	0.72	25.52
Off Highway	523.90	206.61	30.99	4.43	1238.12
Total	599.25	230.21	56.38	5.14	1263.64
Existing Baseline	599.25	230.21	56.38	5.14	1263.64
Net Emissions	0.00	0.00	0.00	0.00	0.00
De Minimis Threshold	100.00	50.00	100.00	100.00	100.00

#### Summary of Estimated Peak Daily Emissions

(1999-2000)	CO	ROG	NOx	SOx	PM10
Peak Day Vehicle Trips	lb/day	lb/day	lb/day	lb/day	lb/day
On Road	2849.99	892.70	960.44	27.14	965.41
Off Highway	5504.61	2170.83	325.63	46.52	5377.53
Total for Halloween Weekend	8354.61	3063.54	1286.06	73.65	6342.94
On Road	4882.19	1529.25	1645.28	46.48	1653.80
Off Highway	9429.69	3718.75	557.81	79.69	9211.98
Total for Thanksgiving Weekend	14311.88	5248.00	2203.09	126.17	10865.78
On Road	3254.79	1019.50	1096.85	30.99	1102.54
Off Highway	6286.46	2479.17	371.88	53.13	6141.32
Total for New Year Weekend	9541.25	3498.67	1468.73	84.11	7243.86
On Road	2034.93	637.40	685.76	19.38	689.32
Off Highway	3930.36	1550.00	232.50	33.21	3839.62
Martin Luther King's Birthday	5965.29	2187.40	918.26	52.59	4528.93
On Road	4067.12	1273.95	1370.61	38.72	1377.71
Off Highway	7855.43	3097.92	464.69	66.38	7674.07
Total for President's Day	11922.55	4371.86	1835.29	105.11	9051.78
On Road	3254.79	1019.50	1096.85	30.99	1102.54
Off Highway	6286.46	2479.17	371.88	53.13	6141.32
Total for Easter Weekend	9541.25	3498.67	1468.73	84.11	7243.86



Peak Day Baseline (1999-2000)	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
Halloween	8354.61	3063.54	1286.06	73.65	6342.94
Thanksgiving	14311.88	5248.00	2203.09	126.17	10865.78
New Year	9541.25	3498.67	1468.73	84.11	7243.86
Martin Luther King's Birthday	5965.29	2187.40	918.26	52.59	4528.93
President's Day	11922.55	4371.86	1835.29	105.11	9051.78
Easter	9541.25	3498.67	1468.73	84.11	7243.86

Net Emissions	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
Halloween	0.00	0.00	0.00	0.00	0.00
Thanksgiving	0.00	0.00	0.00	0.00	0.00
New Year	0.00	0.00	0.00	0.00	0.00
Martin Luther King's Birthday	0.00	0.00	0.00	0.00	0.00
President's Day	0.00	0.00	0.00	0.00	0.00
Easter	0.00	0.00	0.00	0.00	0.00
Significance Threshold	550	137	137	137	137



# FUGITIVE PM10 EMISSION FACTORS

## (I) POTENTIAL SOURCES:

- (1) OHV travel on Unpaved Surfaces.
- (2) Motor Vehicle Travel on Paved Roads.

## (II) EMISSION FACTORS AND ASSUMPTIONS:

- (1) OHV Travel on Unpaved Roads.

Emission Factor (SCAQMD Table A9-9-D): (reference 1)

$EF(1) = 2.1 (G/12) (H/30) [(J/3)^{0.7}] [(I/4)^{0.5}] [(365-K)/365]$  lb/vehicle mile traveled (vmt)

where:

G = Silt Loading (%):

6 (reference 1)

H = Mean Vehicle Speed (mph):

15 (reference 1)

J = Mean Vehicle Weight (tons) - see tables below

(reference 1)

I = Number of Wheels - see tables below

(reference 1)

K = Number of Days > 0.01 in. Precipitation:

18 (reference 1)

4-Wheel All Terrain Vehicles		
Parameter	Loaded	Unloaded
J	1	0.5
I	4	4
PM10 Emission Rate		
lb/VMT	0.23	0.14

Off-Highway Motorcycles		
Parameter	Loaded	Unloaded
J	0.35	0.25
I	2	2
PM10 Emission Rate		
lb/VMT	0.080	0.060

Average OHV Emission Rate = 0.16

	OHV	Estimated Emission Rate	
Annual OHV	15,619,590	1210.52	tons
Halloween	32,823	5087.57	pounds
Thanksgiving	56,228	8715.26	pounds
New Year	37,485	5810.18	pounds
Martin Luther King	23,436	3632.58	pounds
Presidents Day	46,841	7260.28	pounds
Easter	37,485	5810.18	pounds



- (2) Passenger Vehicle Travel on Paved Highways.  
Emission Factor (SCAQMD Table A9-9-B):

$$EF(3) = V \times G \text{ lb}$$

V = Vehicle Miles Travelled

G = 0.0064 lb/VMT (For Major Streets/Highways with street cleaning)

VMT = 7437900

EF(3) =	47602.56 pounds
Annual OHV	23.80128 tons
Halloween	900.288 pounds
Peak Arrival day (veh/day)	140670
Thanksgiving	1542.24 pounds
Peak Arrival day (veh/day)	240975
New Year	1028.16 pounds
Peak Arrival day (veh/day)	160650
Martin Luther King	642.816 pounds
Peak Arrival day (veh/day)	100440
Presidents Day	1284.768 pounds
Peak Arrival day (veh/day)	200745
Easter	1028.16 pounds
Peak Arrival day (veh/day)	160650



# TABLE OPERATIONAL EMISSIONS FROM OHV SOURCE

Emission Factors (EF) from Table A9-8-B: lb/hp-hr

Off-Highway Vehicles	HP rating	Loading percent	Max hrs/day	Max-daily HP-Hr	EF unit	EF CO	lb/day CO	EF ROG	lb/day ROG	EF NOx	lb/day NOx	EF SOx	lb/day SOx	EF PM10	lb/day PM10
Motorcycles	25	100%	6	150	g/hp-hr	80	1.0582011	10	0.1323	1.5	0.01984	0.95	0.0126	8.2	0.1085
All Terrain Vehicles	125	100%	6	750	g/hp-hr	97.5	1.2896825	60	0.7937	9	0.11905	0.55	0.0073	1.15	0.0152
<b>TOTAL, lb</b>							<b>2.35</b>		<b>0.93</b>		<b>0.14</b>		<b>0.02</b>		<b>0.12</b>

Annual	446,274						523.8997		206.61		30.9913		4.4273		27.597
Halloween	9,378						5504.6131		2170.8		325.625		46.518		289.96
Thanksgiving	16,065						9429.6875		3718.8		557.813		79.688		496.72
New Year	10,710						6286.4583		2479.2		371.875		53.125		331.15
MLK	6,696						3930.3571		1550		232.5		33.214		207.04
Presidents	13,383						7855.4315		3097.9		464.688		66.384		413.79
Easter	10,710						6286.4583		2479.2		371.875		53.125		331.15
<b>AQ Significance Thresholds</b>							<b>550</b>		<b>137</b>		<b>137</b>		<b>137</b>		<b>137</b>

Source: EPA Nonroad Engine and Vehicle Study, 1991



### On-Road Mobile Source Emissions Factors

Vehicle Type	Running Exhaust		Start-Up		Start-Up		Hot Soak		Diurnal	
	CO g/mile	ROG g/mile	NOx g/mile	SOx g/mile	PM10 g/mile	CO g/trip	ROG g/trip	ROG g/trip	ROG g/trip	NOx g/trip
Light-Duty Trucks - Cat	3.76	0.28	0.74	0.01	0.04	45.7	4.08	0.62	18.96	2.42
Heavy Heavy Duty Diesel Truck	7.2	1.22	9.2	0.32	0.72	0	0	0	0	0

### Estimated Vehicle Emissions Annual Average

Vehicle Type	Average worker/day	VMT/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/year	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day	Tons/year
Light-Duty Trucks - Cat	371895	15	5578425	743790	121177.427	42200.339	13068.797	122.981	491.925	
Heavy Heavy Duty Diesel Truck	123965	15	1859475	247930	29515.476	5001.233	37714.220	1311.799	2951.548	
<b>Total Off-Site</b>			7437900		<b>75.346</b>	<b>23.601</b>	<b>25.392</b>	<b>0.717</b>	<b>1.722</b>	

### Halloween

Vehicle Type	Average worker/day	VMT/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
Light-Duty Trucks - Cat	7,034	15	105502.5	14067	2291.780	798.118	247.165	2.326	9.304
Heavy Heavy Duty Diesel Truck	2,345	15	35167.5	4689	558.214	94.586	713.274	24.810	55.821
<b>Total Off-Site</b>			140670		<b>2849.994</b>	<b>892.704</b>	<b>960.439</b>	<b>27.135</b>	<b>65.125</b>

### Thanksgiving

Vehicle Type	Average worker/day	VMT/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
Light-Duty Trucks - Cat	12,049	15	180731.25	24097.5	3925.938	1367.217	423.406	3.984	15.938
Heavy Heavy Duty Diesel Truck	4,016	15	60243.75	8032.5	956.250	162.031	1221.875	42.500	95.625
<b>Total Off-Site</b>			240975		<b>4882.188</b>	<b>1529.249</b>	<b>1645.281</b>	<b>46.484</b>	<b>111.563</b>

### New Year

Vehicle Type	Average worker/day	VMT/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
Light-Duty Trucks - Cat	8,033	15	120487.5	16065	2617.292	911.478	282.271	2.656	10.625
Heavy Heavy Duty Diesel Truck	2,678	15	40162.5	5355	637.500	108.021	814.583	28.333	63.750
<b>Total Off-Site</b>			160650		<b>3254.792</b>	<b>1019.499</b>	<b>1096.854</b>	<b>30.990</b>	<b>74.375</b>



### ***Martin Luther King's Birthday***

<b>Vehicle Type</b>	<b>Average worker/day</b>	<b>VMT/trip mi/trip</b>	<b>Total VMT mi/day</b>	<b>Starts No.Day</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Light-Duty Trucks - Cat	5,022	15	75330	10044	1636.357	569.865	176.479	1.661	6.643
Heavy Heavy Duty Diesel Truck	1,674	15	25110	3348	398.571	67.536	509.286	17.714	39.857
<b>Total Off-Site</b>			100440		<b>2034.929</b>	<b>637.401</b>	<b>685.764</b>	<b>19.375</b>	<b>46.500</b>

### ***President's Day***

<b>Vehicle Type</b>	<b>Average worker/day</b>	<b>VMT/trip mi/trip</b>	<b>Total VMT mi/day</b>	<b>Starts No.Day</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Light-Duty Trucks - Cat	10,037	15	150558.75	20074.5	3270.515	1138.965	352.720	3.319	13.277
Heavy Heavy Duty Diesel Truck	3,346	15	50186.25	6691.5	796.607	134.981	1017.887	35.405	79.661
<b>Total Off-Site</b>			200745		<b>4067.122</b>	<b>1273.946</b>	<b>1370.607</b>	<b>38.724</b>	<b>92.938</b>

### ***Easter***

<b>Vehicle Type</b>	<b>Average worker/day</b>	<b>VMT/trip mi/trip</b>	<b>Total VMT mi/day</b>	<b>Starts No.Day</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Light-Duty Trucks - Cat	8,033	15	120487.5	16065	2617.292	911.478	282.271	2.656	10.625
Heavy Heavy Duty Diesel Truck	2,678	15	40162.5	5355	637.500	108.021	814.583	28.333	63.750
<b>Total Off-Site</b>			160650		<b>3254.792</b>	<b>1019.499</b>	<b>1096.854</b>	<b>30.990</b>	<b>74.375</b>

#### **SOURCE:**

CARB MVEI7G Program, 2001 South Coast Air Basin (summer), non-enhanced I/M, 35 mph

#### **ASSUMPTIONS:**

- 1 The hydrocarbon emission factors presented are Reactive Organic Gas (ROG) Efs. The ROG number is a combination of the ROG exhaust + running evaporative losses.
- 2 The PM10 emission factors are Total PM10 Efs. The PM10 Efs include the exhaust PM + Tire Wear PM + Brake Wear PM.
- 3 Emission factors from EMFAC7G (updated February 2000) were used.
- 4 All summertime emission factors were calculated at 75 F.
- 5 Emission factors assume 100% weighting to summertime fuel mix.
- 6 Emission factors include Running Exhaust, Running Evaporative Losses, and PM10 from tire wear and brake wear.
- 7 Sulfur oxide as SO2 emissions were calculated by converting the total daily SO2 mass into grams and then dividing by the total daily vehicle miles traveled. The total daily SO2 and total daily vehicle miles traveled were obtained from the BURDEN output for each modeled year.







Future Baseline		Number of Vehicle Trips		
		OHV Use	Other Use	Total
Annual Vehicle Trips		925,714	102,857	1,028,571
Peak Day Vehicle Trips				
	Halloween	19,445	2,161	21,606
	Thanksgiving	33,330	3,703	37,033
	New Year	22,219	2,469	24,688
	Martin Luther King's Birthday	13,884	1,543	15,427
	President's Day	27,769	3,085	30,854
	Easter	22,219	2,469	24,688

Summary of Estimated Annual Emissions						
Annual Vehicle Trips		CO tons/year	ROG tons/year	NOx tons/year	SOx tons/year	PM10 tons/year
Future Baseline						
	On Road	149.66	47.42	52.41	1.49	52.94
	Off Highway	1086.73	428.57	64.29	9.18	2568.24
	Total	1236.39	476.00	116.70	10.67	2621.19
Existing Condition		599.25	230.21	56.38	5.14	1263.64
Net Emissions		637.14	245.79	60.32	5.53	1357.55
De Minimis Threshold		100.00	50.00	100.00	100.00	100.00

Summary of Estimated Peak Daily Emissions						
(2012-2013)		CO	ROG	NOx	SOx	PM10
Peak Day Vehicle Trips		lb/day	lb/day	lb/day	lb/day	lb/day
	On Road	5658.71	1793.16	1981.84	56.27	2001.80
	Off Highway	11413.89	4501.25	675.19	96.46	11150.37
	Halloween	17072.60	6294.41	2657.02	152.72	13152.17
	On Road	9699.12	3073.50	3396.90	96.44	3431.11
	Off Highway	19563.57	7715.21	1157.28	165.33	19111.90
	Thanksgiving	29262.69	10788.71	4554.18	261.77	22543.00
	On Road	6465.91	2048.95	2264.54	64.29	2287.34
	Off Highway	13042.03	5143.33	771.50	110.21	12740.92
	New Year	19507.93	7192.28	3036.04	174.51	15028.26
	On Road	4040.41	1280.34	1415.06	40.17	1429.31
	Off Highway	8149.68	3213.96	482.09	68.87	7961.53
	Martin Luther King's Birthday	12190.09	4494.30	1897.15	109.05	9390.84
	On Road	8080.81	2560.69	2830.12	80.35	2858.62
	Off Highway	16299.36	6427.92	964.19	137.74	15923.05
	President's Day	24380.17	8988.60	3794.31	218.09	18781.68
	On Road	6465.91	2048.95	2264.54	64.29	2287.34
	Off Highway	13042.03	5143.33	771.50	110.21	12740.92
	Easter	19507.93	7192.28	3036.04	174.51	15028.26



<b>Existing Condition (1999-2000)</b>	<b>CO</b>	<b>ROG</b>	<b>NOx</b>	<b>SOx</b>	<b>PM10</b>
<b>Peak Day</b>	<b>lb/day</b>	<b>lb/day</b>	<b>lb/day</b>	<b>lb/day</b>	<b>lb/day</b>
Halloween	8354.61	3063.54	1286.06	73.65	6342.94
Thanksgiving	14311.88	5248	2203.09	126.17	10865.78
New Year	9541.25	3498.67	1468.73	84.11	7243.86
Martin Luther King's Birthday	5965.29	2187.4	918.26	52.59	4528.93
President's Day	11922.55	4371.86	1835.29	105.11	9051.78
Easter	9541.25	3498.67	1468.73	84.11	7243.86

<b>Net Emissions</b>	<b>CO</b>	<b>ROG</b>	<b>NOx</b>	<b>SOx</b>	<b>PM10</b>
<b>(Future Baseline - Existing Condition)</b>	<b>lb/day</b>	<b>lb/day</b>	<b>lb/day</b>	<b>lb/day</b>	<b>lb/day</b>
Halloween	8717.99	3230.87	1370.96	79.07	6809.23
Thanksgiving	14950.81	5540.71	2351.09	135.60	11677.22
New Year	9966.68	3693.61	1567.31	90.40	7784.40
Martin Luther King's Birthday	6224.80	2306.90	978.89	56.46	4861.91
President's Day	12457.62	4616.74	1959.02	112.98	9729.90
Easter	9966.68	3693.61	1567.31	90.40	7784.40
Significance Threshold	550	137	137	137	137



# FUGITIVE PM10 EMISSION FACTORS

## (I) POTENTIAL SOURCES:

- (1) OHV travel on Unpaved Surfaces.
- (2) Motor Vehicle Travel on Paved Roads.

## (II) EMISSION FACTORS AND ASSUMPTIONS:

- (1) OHV Travel on Unpaved Roads.

Emission Factor (SCAQMD Table A9-9-D): (reference 1)

$EF(1) = 2.1 (G/12) (H/30) [(J/3)^{0.7}] [(I/4)^{0.5}] [(365-K)/365]$  lb/vehicle mile traveled (vmt)

where:

G = Silt Loading (%): 6 (reference 1)

H = Mean Vehicle Speed (mph): 15 (reference 1)

J = Mean Vehicle Weight (tons) - see tables below (reference 1)

I = Number of Wheels - see tables below (reference 1)

K = Number of Days > 0.01 in. Precipitation: 18 (reference 1)

4-Wheel All Terrain Vehicles		
Parameter	Loaded	Unloaded
J	1	0.5
I	4	4
PM10 Emission Rate lb/VMT	0.23	0.14

Off-Highway Motorcycles		
Parameter	Loaded	Unloaded
J	0.35	0.25
I	2	2
PM10 Emission Rate lb/VMT	0.080	0.060

Average OHV Emission Rate = 0.16

	OHV	Estimated Emission Rate	
Annual OHV	32,399,990	2511.00	tons
Halloween	68,059	10549.13	pounds
Thanksgiving	116,654	18081.36	pounds
New Year	77,767	12053.92	pounds
Martin Luther King	48,595	7532.23	pounds
Presidents Day	97,190	15064.47	pounds
Easter	77,767	12053.92	pounds



- (2) Passenger Vehicle Travel on Paved Highways.  
Emission Factor (SCAQMD Table A9-9-B):

$$EF(2) = V \times G \text{ lb}$$

V = Vehicle Miles Traveled

G = 0.0064 lb/VT (For Major Streets/Highways with street cleaning)

VMT =	15428565
EF(2) =	98742.816
	49.37 tons
Estimated Emission Rate	
Halloween	1866.758602 pounds
Peak Arrival day (veh/day)	291681.0315
Thanksgiving	3199.651546 pounds
Peak Arrival day (veh/day)	499945.554
New Year	2133.04343 pounds
Peak Arrival day (veh/day)	333288.036
Martin Luther King	1332.892944 pounds
Peak Arrival day (veh/day)	208264.5225
Presidents Day	2665.785888 pounds
Peak Arrival day (veh/day)	416529.045
Easter	2133.04343 pounds
Peak Arrival day (veh/day)	333288.036



# TABLE OPERATIONAL EMISSIONS FROM OHV SOURCE

Emission Factors (EF) from Table A9-8-B: lb/hp-hr

Off-Highway Vehicles	HP rating	Loading percent	Max hrs/day	Max-daily HP-Hr	EF unit	EF CO	lb/day CO	EF ROG	lb/day ROG	EF NOx	lb/day NOx	EF SOx	lb/day SOx	EF PM10	lb/day PM10
Motorcycles	25	100%	6	150	g/hp-hr	80	1.0582011	10	0.1323	1.5	0.01984	0.95	0.0126	8.2	0.1085
All Terrain Vehicles	125	100%	6	750	g/hp-hr	97.5	1.2896825	60	0.7937	9	0.11905	0.55	0.0073	1.15	0.0152
<b>TOTAL, lb</b>							<b>2.35</b>		<b>0.93</b>		<b>0.14</b>		<b>0.02</b>		<b>0.12</b>

Annual	925,714						1086.7344		428.57		64.2857		9.1837		57.245
Halloween	19,445						11413.885		4501.3		675.188		96.455		601.24
Thanksgiving	33,330						19563.566		7715.2		1157.28		165.33		1030.5
New Year	22,219						13042.025		5143.3		771.5		110.21		687
MLK	13,884						8149.6809		3214		482.094		68.871		429.29
Presidents	27,769						16299.362		6427.9		964.188		137.74		858.59
Easter	22,219						13042.025		5143.3		771.5		110.21		687

<b>AQ Significance Thresholds</b>							<b>550</b>		<b>137</b>		<b>137</b>		<b>137</b>		<b>137</b>
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Source: EPA Nonroad Engine and Vehicle Study, 1991



### On-Road Mobile Source Emissions Factors

Vehicle Type	CO	ROG	Running Exhaust			Start-Up	Start-Up	Hot Soak	Diurnal	Start-Up
	g/mile	g/mile	NOx g/mile	SOx g/mile	PM10 g/mile	CO g/trip	ROG g/trip	ROG g/trip	ROG g/trip	NOx g/trip
Light-Duty Trucks - Cat	3.24	0.16	0.72	0.01	0.04	45.7	4.08	0.62	18.96	2.42
Heavy Heavy Duty Diesel Truck	7.2	1.22	9.2	0.32	0.72	0	0	0	0	0

### Estimated Vehicle Emissions Annual Average

Vehicle Type	Average worker/day	VMT/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/year	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day	
Light-Duty Trucks - Cat	771428.25	15	11571424	1542856.5	238095.139	84475.672	26598.628	255.102	1020.408	
Heavy Heavy Duty Diesel Truck	257142.75	15	3857141.3	514285.5	61224.464	10374.145	78231.260	2721.087	6122.446	
<b>Total Off-Site</b>			15428565		<b>149.660</b>	<b>47.425</b>	<b>52.415</b>	<b>1.488</b>	<b>3.571</b>	<b>Tons/year</b>

### Halloween

Vehicle Type	Average worker/day	VMT/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
Light-Duty Trucks - Cat	14,584	15	218760.77	29168.103	4501.250	1597.035	502.854	4.823	19.291
Heavy Heavy Duty Diesel Truck	4,861	15	72920.258	9722.7011	1157.464	196.126	1478.982	51.443	115.746
<b>Total Off-Site</b>			291681.03		<b>5658.715</b>	<b>1793.160</b>	<b>1981.836</b>	<b>56.266</b>	<b>135.038</b>

### Thanksgiving

Vehicle Type	Average worker/day	VMT/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
Light-Duty Trucks - Cat	24,997	15	374959.17	49994.555	7715.209	2737.341	861.899	8.266	33.065
Heavy Heavy Duty Diesel Truck	8,332	15	124986.39	16664.852	1983.911	336.163	2534.997	88.174	198.391
<b>Total Off-Site</b>			499945.55		<b>9699.120</b>	<b>3073.503</b>	<b>3396.896</b>	<b>96.440</b>	<b>231.456</b>

### New Year

Vehicle Type	Average worker/day	VMT/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
Light-Duty Trucks - Cat	16,664	15	249966.03	33328.804	5143.334	1824.844	574.584	5.511	22.043
Heavy Heavy Duty Diesel Truck	5,555	15	83322.009	11109.601	1322.572	224.102	1689.953	58.781	132.257
<b>Total Off-Site</b>			333288.04		<b>6465.905</b>	<b>2048.947</b>	<b>2264.536</b>	<b>64.292</b>	<b>154.300</b>



### **Martin Luther King's Birthday**

<b>Vehicle Type</b>	<b>Average worker/day</b>	<b>VMT/trip mi/trip</b>	<b>Total VMT mi/day</b>	<b>Starts No.Day</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Light-Duty Trucks - Cat	10,413	15	156198.39	20826.452	3213.959	1140.306	359.045	3.444	13.774
Heavy Heavy Duty Diesel Truck	3,471	15	52066.131	6942.1507	826.447	140.037	1056.015	36.731	82.645
<b>Total Off-Site</b>			208264.52		<b>4040.405</b>	<b>1280.343</b>	<b>1415.060</b>	<b>40.174</b>	<b>96.419</b>

### **President's Day**

<b>Vehicle Type</b>	<b>Average worker/day</b>	<b>VMT/trip mi/trip</b>	<b>Total VMT mi/day</b>	<b>Starts No.Day</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Light-Duty Trucks - Cat	20,826	15	312396.78	41652.904	6427.917	2280.612	718.090	6.887	27.548
Heavy Heavy Duty Diesel Truck	6,942	15	104132.26	13884.301	1652.893	280.074	2112.030	73.462	165.289
<b>Total Off-Site</b>			416529.04		<b>8080.810</b>	<b>2560.686</b>	<b>2830.120</b>	<b>80.349</b>	<b>192.838</b>

### **Easter**

<b>Vehicle Type</b>	<b>Average worker/day</b>	<b>VMT/trip mi/trip</b>	<b>Total VMT mi/day</b>	<b>Starts No.Day</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Light-Duty Trucks - Cat	16,664	15	249966.03	33328.804	5143.334	1824.844	574.584	5.511	22.043
Heavy Heavy Duty Diesel Truck	5,555	15	83322.009	11109.601	1322.572	224.102	1689.953	58.781	132.257
<b>Total Off-Site</b>			333288.04		<b>6465.905</b>	<b>2048.947</b>	<b>2264.536</b>	<b>64.292</b>	<b>154.300</b>

**SOURCE:** CARB MVEI7G Program, 2001 South Coast Air Basin (summer), non-enhanced I/M, 35 mph

### **ASSUMPTIONS:**

- 1 The hydrocarbon emission factors presented are Reactive Organic Gas (ROG) Efs. The ROG number is a combination of the ROG exhaust + running evaporative losses.
- 2 The PM10 emission factors are Total PM10 Efs. The PM10 Efs include the exhaust PM + Tire Wear PM + Brake Wear PM.
- 3 Emission factors from EMFAC7G (updated February 2000) were used.
- 4 All summertime emission factors were calculated at 75 F.
- 5 Emission factors assume 100% weighting to summertime fuel mix.
- 6 Emission factors include Running Exhaust, Running Evaporative Losses, and PM10 from tire wear and brake wear.
- 7 Sulfur oxide as SO2 emissions were calculated by converting the total daily SO2 mass into grams and then dividing by the total daily vehicle miles traveled. The total daily SO2 and total daily vehicle miles traveled were obtained from the BURDEN output for each modeled year.







**Alternative 1****Number of Vehicle Trips**

	OHV Use	Other Use	Total
Annual Vehicle Trips	1,065,087	118,343	1,183,430
Peak Day Vehicle Trips			
Halloween	22,365	2,485	24,850
Thanksgiving	38,345	4,261	42,605
New Year	25,557	2,840	28,397
Martin Luther King's Birthday	15,980	1,776	17,755
President's Day	31,960	3,551	35,511
Easter	25,557	2,840	28,397

**Summary of Estimated Annual Emissions**

(2012-2013)	CO	ROG	NOx	SOx	PM10
Annual Vehicle Trips	tons/year	tons/year	tons/year	tons/year	tons/year
Alternative 1					
On Road	172.19	54.57	60.31	1.71	60.91
Off Highway	1250.35	493.10	73.96	10.57	2954.91
Total	1422.54	547.66	134.27	12.28	3015.83
Future Baseline	1236.39	476	116.7	10.67	2621.19
Net Emissions	186.15	71.66	17.57	1.61	394.64
De Minimis Threshold	100.00	50.00	100.00	100.00	100.00

**Summary of Estimated Peak Daily Emissions**

(2012-2013)	CO	ROG	NOx	SOx	PM10
Peak Day Vehicle Trips	lb/day	lb/day	lb/day	lb/day	lb/day
On Road	6,508.33	2,062.39	2,279.40	64.71	2,302.35
Off Highway	13,127.60	5,177.08	776.56	110.94	12,824.52
Total for Halloween Weekend	19,635.94	7,239.47	3,055.96	175.65	15,126.88
On Road	11,158.45	3,535.94	3,907.99	110.95	3,947.35
Off Highway	22,507.11	8,876.04	1,331.41	190.20	21,987.48
Total for Thanksgiving Weekend	33,665.56	12,411.99	5,239.40	301.15	25,934.83
On Road	7,437.31	2,356.77	2,604.75	73.95	2,630.98
Off Highway	15,001.39	5,916.04	887.41	126.77	14,655.05
Total for New Year Weekend	22,438.70	8,272.81	3,492.15	200.72	17,286.03
On Road	4,650.12	1,473.55	1,628.60	46.24	1,645.00
Off Highway	9,379.50	3,698.96	554.84	79.26	9,162.95
Martin Luther King's Birthday	14,029.62	5,172.51	2,183.44	125.50	10,807.95
On Road	9,300.50	2,947.19	3,257.29	92.48	3,290.09
Off Highway	18,759.53	7,398.13	1,109.72	158.53	18,326.42
Total for President's Day	28,060.03	10,345.31	4,367.01	251.01	21,616.52
On Road	7,437.31	2,356.77	2,604.75	73.95	2,630.98
Off Highway	15,001.39	5,916.04	887.41	126.77	14,655.05
Total for Easter Weekend	22,438.70	8,272.81	3,492.15	200.72	17,286.03



<b>Peak Day Baseline (1999-2000)</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Halloween	17072.6	6294.41	2657.02	152.72	13152.17
Thanksgiving	29262.69	10788.71	4554.18	261.77	22543
New Year	19507.93	7192.28	3036.04	174.51	15028.26
Martin Luther King's Birthday	12190.09	4494.3	1897.15	109.05	9390.84
President's Day	24380.17	8988.6	3794.31	218.09	18781.68
Easter	19507.93	7192.28	3036.04	174.51	15028.26

<b>Net Emissions</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Halloween	2563.34	945.06	398.94	22.93	1974.71
Thanksgiving	4402.87	1623.28	685.22	39.38	3391.83
New Year	2930.77	1080.53	456.11	26.21	2257.77
Martin Luther King's Birthday	1839.53	678.21	286.29	16.45	1417.11
President's Day	3679.86	1356.71	572.70	32.92	2834.84
Easter	2930.77	1080.53	456.11	26.21	2257.77
Significance Threshold	550	137	137	137	137



# FUGITIVE PM10 EMISSION FACTORS

## (I) POTENTIAL SOURCES:

- (1) OHV travel on Unpaved Surfaces.
- (2) Motor Vehicle Travel on Paved Roads.

## (II) EMISSION FACTORS AND ASSUMPTIONS:

- (1) OHV Travel on Unpaved Roads.

Emission Factor (SCAQMD Table A9-9-D): (reference 1)

$EF(1) = 2.1 (G/12) (H/30) [(J/3)^{0.7}] [(I/4)^{0.5}] [(365-K)/365]$  lb/vehicle mile traveled (vmt)  
where:

G = Silt Loading (%): 6 (reference 1)  
H = Mean Vehicle Speed (mph): 15 (reference 1)  
J = Mean Vehicle Weight (tons) - see tables below (reference 1)  
I = Number of Wheels - see tables below (reference 1)  
K = Number of Days > 0.01 in. Precipitation: 18 (reference 1)

4-Wheel All Terrain Vehicles		
Parameter	Loaded	Unloaded
J	1	0.5
I	4	4
PM10 Emission Rate lb/VMT	0.23	0.14

Off-Highway Motorcycles		
Parameter	Loaded	Unloaded
J	0.35	0.25
I	2	2
PM10 Emission Rate lb/VMT	0.080	0.060

Average OHV Emission Rate = 0.16

	OHV	Estimated Emission Rate	
Annual OHV	37,278,045	2889.05	tons
Halloween	78,278	12133.01	pounds
Thanksgiving	134,206	20801.89	pounds
New Year	89,451	13864.84	pounds
Martin Luther King	55,928	8668.88	pounds
Presidents Day	111,860	17338.25	pounds
Easter	89,451	13864.84	pounds

- (2) Passenger Vehicle Travel on Paved Highways.



Emission Factor (SCAQMD Table A9-9-B):

$$EF(2) = V \times G \text{ lb}$$

V = Vehicle Miles Traveled

G = 0.0064 lb/VMT (For Major Streets/Highways with street cleaning)

VMT =	17751450
EF(2) =	113609.28 pounds
Annual	56.80464 tons
Estimated Emission Rate	
Halloween	2147.04 pounds
Peak Arrival day (veh/day)	335475
Thanksgiving	3681.072 pounds
Peak Arrival day (veh/day)	575167.5
New Year	2453.5008 pounds
Peak Arrival day (veh/day)	383359.5
Martin Luther King	1534.032 pounds
Peak Arrival day (veh/day)	239692.5
Presidents Day	3068.1504 pounds
Peak Arrival day (veh/day)	479398.5
Easter	2453.5008 pounds
Peak Arrival day (veh/day)	383359.5



# TABLE OPERATIONAL EMISSIONS FROM OHV SOURCE

Emission Factors (EF) from Table A9-8-B: lb/hp-hr

Off-Highway Vehicles	HP rating	Loading percent	Max hrs/day	Max-daily HP-Hr	EF unit	EF CO	lb/day CO	EF ROG	lb/day ROG	EF NOx	lb/day NOx	EF SOx	lb/day SOx	EF PM10	lb/day PM10
Motorcycles	25	100%	6	150	g/hp-hr	80	1.0582011	10	0.1323	1.5	0.01984	0.95	0.0126	8.2	0.1085
All Terrain Vehicles	125	100%	6	750	g/hp-hr	97.5	1.2896825	60	0.7937	9	0.11905	0.55	0.0073	1.15	0.0152
<b>TOTAL, lb</b>							<b>2.35</b>		<b>0.93</b>		<b>0.14</b>		<b>0.02</b>		<b>0.12</b>

Annual	1,065,087						1250.3501		493.1		73.9644		10.566		65.864
Halloween	22,365						13127.604		5177.1		776.563		110.94		691.51
Thanksgiving	38,345						22507.106		8876		1331.41		190.2		1185.6
New Year	25,557						15001.391		5916		887.406		126.77		790.21
MLK	15,980						9379.5015		3699		554.844		79.263		494.08
Presidents	31,960						18759.531		7398.1		1109.72		158.53		988.18
Easter	25,557						15001.391		5916		887.406		126.77		790.21

<b>AQ Significance Thresholds</b>							<b>550</b>		<b>137</b>		<b>137</b>		<b>137</b>		<b>137</b>
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Source: EPA Nonroad Engine and Vehicle Study, 1991



### On-Road Mobile Source Emissions Factors

Vehicle Type	CO	ROG	Running Exhaust		PM10	Start-Up	Start-Up	Hot Soak	Diurnal	Start-Up
	g/mile	g/mile	NOx g/mile	SOx g/mile	g/mile	CO g/trip	ROG g/trip	ROG g/trip	ROG g/trip	NOx g/trip
Light-Duty Trucks - Cat	3.24	0.16	0.72	0.01	0.04	45.7	4.08	0.62	18.96	2.42
Heavy Heavy Duty Diesel Truck	7.2	1.22	9.2	0.32	0.72	0	0	0	0	0

### Estimated Vehicle Emissions Annual Average

Vehicle Type	Average worker/day	VMT/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/year	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day	
Light-Duty Trucks - Cat	887572.5	15	13313588	1775145	273942.130	97194.112	30603.249	293.509	1174.038	
Heavy Heavy Duty Diesel Truck	295857.5	15	4437862.5	591715	70442.262	11936.050	90009.557	3130.767	7044.226	
<b>Total Off-Site</b>			17751450		<b>172.192</b>	<b>54.565</b>	<b>60.306</b>	<b>1.712</b>	<b>4.109</b>	<b>Tons/year</b>

### Halloween

Vehicle Type	Average worker/day	VMT/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
Light-Duty Trucks - Cat	16,774	15	251606.25	33547.5	5177.083	1836.819	578.354	5.547	22.188
Heavy Heavy Duty Diesel Truck	5,591	15	83868.75	11182.5	1331.250	225.573	1701.042	59.167	133.125
<b>Total Off-Site</b>			335475		<b>6508.333</b>	<b>2062.392</b>	<b>2279.396</b>	<b>64.714</b>	<b>155.313</b>

### Thanksgiving

Vehicle Type	Average worker/day	VMT/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
Light-Duty Trucks - Cat	28,758	15	431375.63	57516.75	8876.042	3149.202	991.581	9.510	38.040
Heavy Heavy Duty Diesel Truck	9,586	15	143791.88	19172.25	2282.411	386.742	2916.414	101.440	228.241
<b>Total Off-Site</b>			575167.5		<b>11158.452</b>	<b>3535.943</b>	<b>3907.994</b>	<b>110.951</b>	<b>266.281</b>

### New Year

Vehicle Type	Average worker/day	VMT/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
Light-Duty Trucks - Cat	19,168	15	287519.63	38335.95	5916.042	2099.000	660.906	6.339	25.354
Heavy Heavy Duty Diesel Truck	6,389	15	95839.875	12778.65	1521.268	257.770	1943.842	67.612	152.127
<b>Total Off-Site</b>			383359.5		<b>7437.310</b>	<b>2356.770</b>	<b>2604.749</b>	<b>73.951</b>	<b>177.481</b>



### **Martin Luther King's Birthday**

<b>Vehicle Type</b>	<b>Average worker/day</b>	<b>VMT/trip mi/trip</b>	<b>Total VMT mi/day</b>	<b>Starts No.Day</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Light-Duty Trucks - Cat	11,985	15	179769.38	23969.25	3698.958	1312.383	413.226	3.963	15.853
Heavy Heavy Duty Diesel Truck	3,995	15	59923.125	7989.75	951.161	161.169	1215.372	42.274	95.116
<b>Total Off-Site</b>			239692.5		<b>4650.119</b>	<b>1473.552</b>	<b>1628.599</b>	<b>46.237</b>	<b>110.969</b>

### **President's Day**

<b>Vehicle Type</b>	<b>Average worker/day</b>	<b>VMT/trip mi/trip</b>	<b>Total VMT mi/day</b>	<b>Starts No.Day</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Light-Duty Trucks - Cat	23,970	15	359548.88	47939.85	7398.125	2624.840	826.476	7.927	31.706
Heavy Heavy Duty Diesel Truck	7,990	15	119849.63	15979.95	1902.375	322.347	2430.813	84.550	190.238
<b>Total Off-Site</b>			479398.5		<b>9300.500</b>	<b>2947.187</b>	<b>3257.289</b>	<b>92.477</b>	<b>221.944</b>

### **Easter**

<b>Vehicle Type</b>	<b>Average worker/day</b>	<b>VMT/trip mi/trip</b>	<b>Total VMT mi/day</b>	<b>Starts No.Day</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Light-Duty Trucks - Cat	19,168	15	287519.63	38335.95	5916.042	2099.000	660.906	6.339	25.354
Heavy Heavy Duty Diesel Truck	6,389	15	95839.875	12778.65	1521.268	257.770	1943.842	67.612	152.127
<b>Total Off-Site</b>			383359.5		<b>7437.310</b>	<b>2356.770</b>	<b>2604.749</b>	<b>73.951</b>	<b>177.481</b>

#### **SOURCE:**

CARB MVEI7G Program, 2001 South Coast Air Basin (summer), non-enhanced I/M, 35 mph

#### **ASSUMPTIONS:**

- 1 The hydrocarbon emission factors presented are Reactive Organic Gas (ROG) Efs. The ROG number is a combination of the ROG exhaust + running evaporative losses.
- 2 The PM10 emission factors are Total PM10 Efs. The PM10 Efs include the exhaust PM + Tire Wear PM + Brake Wear PM.
- 3 Emission factors from EMFAC7G (updated February 2000) were used.
- 4 All summertime emission factors were calculated at 75 F.
- 5 Emission factors assume 100% weighting to summertime fuel mix.
- 6 Emission factors include Running Exhaust, Running Evaporative Losses, and PM10 from tire wear and brake wear.
- 7 Sulfur oxide as SO2 emissions were calculated by converting the total daily SO2 mass into grams and then dividing by the total daily vehicle miles traveled. The total daily SO2 and total daily vehicle miles traveled were obtained from the BURDEN output for each modeled year.







**Alternative 2**
**Number of Vehicle Trips**

	OHV Use	Other Use	Total
Annual Vehicle Trips	841,887	93,543	935,430
Peak Day Vehicle Trips			
Halloween	15,864	1,763	17,627
Thanksgiving	27,190	3,021	30,211
New Year	18,124	2,014	20,138
Martin Luther King's Birthday	11,327	1,259	12,585
President's Day	22,661	2,518	25,179
Easter	18,124	2,014	20,138

**Summary of Estimated Annual Emissions**

Annual Vehicle Trips	CO tons/year	ROG tons/year	NOx tons/year	SOx tons/year	PM10 tons/year
Future Baseline (2012-2013)					
On Road	136.11	43.13	47.67	1.35	48.15
Off Highway	988.33	389.76	58.46	8.35	2335.68
Total	1124.43	432.89	106.13	9.71	2383.83
Future Baseline	1236.39	476	116.7	10.67	2621.19
Net Emissions	-111.96	-43.11	-10.57	-0.96	-237.36
De Minimis Threshold	100.00	50.00	100.00	100.00	100.00

**Summary of Estimated Peak Daily Emissions**

(2012-2013) Peak Day Vehicle Trips	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
On Road	4,616.60	1,462.93	1,616.86	45.90	1,633.14
Off Highway	9,311.88	3,672.29	550.84	78.69	9,096.90
Halloween	13,928.48	5,135.22	2,167.70	124.60	10,730.04
On Road	7,912.40	2,507.32	2,771.14	78.67	2,799.05
Off Highway	15,959.68	6,293.96	944.09	134.87	15,591.21
Thanksgiving	23,872.08	8,801.28	3,715.23	213.55	18,390.26
On Road	5,274.24	1,671.33	1,847.18	52.44	1,865.79
Off Highway	10,638.38	4,195.42	629.31	89.90	10,392.77
New Year	15,912.62	5,866.74	2,476.49	142.34	12,258.55
On Road	3,296.07	1,044.47	1,154.37	32.77	1,166.00
Off Highway	6,648.33	2,621.88	393.28	56.18	6,494.83
Martin Luther King's Birthday	9,944.40	3,666.35	1,547.66	88.96	7,660.83
On Road	6,594.50	2,089.70	2,309.57	65.57	2,332.83
Off Highway	13,301.41	5,245.63	786.84	112.41	12,994.31
President's Day	19,895.91	7,335.32	3,096.42	177.98	15,327.15
On Road	5,274.24	1,671.33	1,847.18	52.44	1,865.79
Off Highway	10,638.38	4,195.42	629.31	89.90	10,392.77
Easter	15,912.62	5,866.74	2,476.49	142.34	12,258.55



<b>Peak Day Baseline (2012-2013)</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Halloween	17072.6	6294.41	2657.02	152.72	13152.17
Thanksgiving	29262.69	10788.71	4554.18	261.77	22543
New Year	19507.93	7192.28	3036.04	174.51	15028.26
Martin Luther King's Birthday	12190.09	4494.3	1897.15	109.05	9390.84
President's Day	24380.17	8988.6	3794.31	218.09	18781.68
Easter	19507.93	7192.28	3036.04	174.51	15028.26

<b>Net Emissions</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Halloween	-3144.12	-1159.19	-489.32	-28.12	-2422.13
Thanksgiving	-5390.61	-1987.43	-838.95	-48.22	-4152.74
New Year	-3595.31	-1325.54	-559.55	-32.17	-2769.71
Martin Luther King's Birthday	-2245.69	-827.95	-349.49	-20.09	-1730.01
President's Day	-4484.26	-1653.28	-697.89	-40.11	-3454.53
Easter	-3595.31	-1325.54	-559.55	-32.17	-2769.71
Significance Threshold	550	137	137	137	137



# FUGITIVE PM10 EMISSION FACTORS

## (I) POTENTIAL SOURCES:

- (1) OHV travel on Unpaved Surfaces.
- (2) Motor Vehicle Travel on Paved Roads.

## (II) EMISSION FACTORS AND ASSUMPTIONS:

- (1) OHV Travel on Unpaved Roads.

Emission Factor (SCAQMD Table A9-9-D): (reference 1)

$EF(1) = 2.1 (G/12) (H/30) [(J/3)^{0.7}] [(I/4)^{0.5}] [(365-K)/365]$  lb/vehicle mile traveled (vmt)

where:

G = Silt Loading (%): 6 (reference 1)

H = Mean Vehicle Speed (mph): 15 (reference 1)

J = Mean Vehicle Weight (tons) - see tables below (reference 1)

I = Number of Wheels - see tables below (reference 1)

K = Number of Days > 0.01 in. Precipitation: 18 (reference 1)

4-Wheel All Terrain Vehicles		
Parameter	Loaded	Unloaded
J	1	0.5
I	4	4
PM10 Emission Rate lb/VMT	0.23	0.14

Off-Highway Motorcycles		
Parameter	Loaded	Unloaded
J	0.35	0.25
I	2	2
PM10 Emission Rate lb/VMT	0.080	0.060

Average OHV Emission Rate = 0.16

	OHV	Estimated Emission Rate	
Annual OHV	29,466,045	2283.62	tons
Halloween	55,525	8606.38	pounds
Thanksgiving	95,165	14750.52	pounds
New Year	63,435	9832.38	pounds
Martin Luther King	39,643	6144.63	pounds
Presidents Day	79,314	12293.65	pounds
Easter	63,435	9832.38	pounds



- (2) Passenger Vehicle Travel on Paved Highways.  
Emission Factor (SCAQMD Table A9-9-B):

$$EF(2) = V \times G \text{ lb}$$

V = Vehicle Miles Traveled

G = 0.0064 lb/MT (For Major Streets/Highways with street cleaning)

VMT =	14031450
EF(2) =	89801.28 lbs 44.90 tons
Estimated Emission Rate	
Halloween	1522.9728 pounds
Peak Arrival day (veh/day)	237964.5
Thanksgiving	2610.2304 pounds
Peak Arrival day (veh/day)	407848.5
New Year	1739.9232 pounds
Peak Arrival day (veh/day)	271863
Martin Luther King	1087.344 pounds
Peak Arrival day (veh/day)	169897.5
Presidents Day	2175.4656 pounds
Peak Arrival day (veh/day)	339916.5
Easter	1739.9232 pounds
Peak Arrival day (veh/day)	271863



# **TABLE** **OPERATIONAL EMISSIONS FROM OHV SOURCE**

Emission Factors (EF) from Table A9-8-B: lb/hp-hr

<b>Off-Highway</b>	<b>HP</b>	<b>Loading</b>	<b>Max</b>	<b>Max-daily</b>	<b>EF</b>	<b>EF</b>	<b>lb/day</b>	<b>EF</b>	<b>lb/day</b>	<b>EF</b>	<b>lb/day</b>	<b>EF</b>	<b>lb/day</b>	<b>EF</b>	<b>lb/day</b>
<b>Vehicles</b>	<b>rating</b>	<b>percent</b>	<b>hrs/day</b>	<b>HP-Hr</b>	<b>unit</b>	<b>CO</b>	<b>CO</b>	<b>ROG</b>	<b>ROG</b>	<b>NOx</b>	<b>NOx</b>	<b>SOx</b>	<b>SOx</b>	<b>PM10</b>	<b>PM10</b>
Motorcycles	25	100%	6	150	g/hp-hr	80	1.0582011	10	0.1323	1.5	0.01984	0.95	0.0126	8.2	0.1085
All Terrain Vehicles	125	100%	6	750	g/hp-hr	97.5	1.2896825	60	0.7937	9	0.11905	0.55	0.0073	1.15	0.0152
<b>TOTAL, lb</b>							<b>2.35</b>		<b>0.93</b>		<b>0.14</b>		<b>0.02</b>		<b>0.12</b>

Annual	841,887						988.32634		389.76		58.4644		8.3521		52.061
Halloween	15,864						9311.8824		3672.3		550.844		78.692		490.51
Thanksgiving	27,190						15959.68		6294		944.094		134.87		840.69
New Year	18,124						10638.378		4195.4		629.313		89.902		560.39
MLK	11,327						6648.3259		2621.9		393.281		56.183		350.21
Presidents	22,661						13301.406		5245.6		786.844		112.41		700.67
Easter	18,124						10638.378		4195.4		629.313		89.902		560.39

<b>AQ Significance Thresholds</b>							<b>550</b>		<b>137</b>		<b>137</b>		<b>137</b>		<b>137</b>
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Source: EPA Nonroad Engine and Vehicle Study, 1991



### On-Road Mobile Source Emissions Factors

Vehicle Type	CO	ROG	Running Exhaust		PM10	Start-Up	Start-Up	Hot Soak	Diurnal	Start-Up
	g/mile	g/mile	NOx	SOx	g/mile	CO	ROG	g/trip	ROG	NOx
			g/mile	g/mile		g/trip	g/trip		g/trip	g/trip
Light-Duty Trucks - Cat	3.24	0.16	0.72	0.01	0.04	45.7	4.08	0.62	18.96	2.42
Heavy Heavy Duty Diesel Truck	7.2	1.22	9.2	0.32	0.72	0	0	0	0	0

### Estimated Vehicle Emissions Annual Average

Vehicle Type	Average worker/day	VMT/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/year	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day	
Light-Duty Trucks - Cat	701572.5	15	10523588	1403145	216534.722	76826.080	24190.022	232.001	928.006	
Heavy Heavy Duty Diesel Truck	233857.5	15	3507862.5	467715	55680.357	9434.727	71147.123	2474.683	5568.036	
<b>Total Off-Site</b>			14031450		<b>136.108</b>	<b>43.130</b>	<b>47.669</b>	<b>1.353</b>	<b>3.248</b>	<b>Tons/year</b>

### Halloween

Vehicle Type	Average worker/day	VMT/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
Light-Duty Trucks - Cat	11,898	15	178473.38	23796.45	3672.292	1302.922	410.247	3.935	15.738
Heavy Heavy Duty Diesel Truck	3,966	15	59491.125	7932.15	944.304	160.007	1206.610	41.969	94.430
<b>Total Off-Site</b>			237964.5		<b>4616.595</b>	<b>1462.929</b>	<b>1616.858</b>	<b>45.904</b>	<b>110.169</b>

### Thanksgiving

Vehicle Type	Average worker/day	VMT/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
Light-Duty Trucks - Cat	20,392	15	305886.38	40784.85	6293.958	2233.084	703.125	6.744	26.974
Heavy Heavy Duty Diesel Truck	6,797	15	101962.13	13594.95	1618.446	274.237	2068.015	71.931	161.845
<b>Total Off-Site</b>			407848.5		<b>7912.405</b>	<b>2507.320</b>	<b>2771.140</b>	<b>78.674</b>	<b>188.819</b>

### New Year

Vehicle Type	Average worker/day	VMT/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
Light-Duty Trucks - Cat	13,593	15	203897.25	27186.3	4195.417	1488.525	468.688	4.495	17.980
Heavy Heavy Duty Diesel Truck	4,531	15	67965.75	9062.1	1078.821	182.800	1378.494	47.948	107.882
<b>Total Off-Site</b>			271863		<b>5274.238</b>	<b>1671.326</b>	<b>1847.182</b>	<b>52.443</b>	<b>125.863</b>



### ***Martin Luther King's Birthday***

<b>Vehicle Type</b>	<b>Average worker/day</b>	<b>VTM/trip mi/trip</b>	<b>Total VMT mi/day</b>	<b>Starts No.Day</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Light-Duty Trucks - Cat	8,495	15	127423.13	16989.75	2621.875	930.236	292.901	2.809	11.237
Heavy Heavy Duty Diesel Truck	2,832	15	42474.375	5663.25	674.196	114.239	861.473	29.964	67.420
<b>Total Off-Site</b>			169897.5		<b>3296.071</b>	<b>1044.475</b>	<b>1154.374</b>	<b>32.773</b>	<b>78.656</b>

### ***President's Day***

<b>Vehicle Type</b>	<b>Average worker/day</b>	<b>VTM/trip mi/trip</b>	<b>Total VMT mi/day</b>	<b>Starts No.Day</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Light-Duty Trucks - Cat	16,996	15	254937.38	33991.65	5245.625	1861.137	586.011	5.620	22.481
Heavy Heavy Duty Diesel Truck	5,665	15	84979.125	11330.55	1348.875	228.559	1723.563	59.950	134.888
<b>Total Off-Site</b>			339916.5		<b>6594.500</b>	<b>2089.696</b>	<b>2309.574</b>	<b>65.570</b>	<b>157.369</b>

### ***Easter***

<b>Vehicle Type</b>	<b>Average worker/day</b>	<b>VTM/trip mi/trip</b>	<b>Total VMT mi/day</b>	<b>Starts No.Day</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Light-Duty Trucks - Cat	13,593	15	203897.25	27186.3	4195.417	1488.525	468.688	4.495	17.980
Heavy Heavy Duty Diesel Truck	4,531	15	67965.75	9062.1	1078.821	182.800	1378.494	47.948	107.882
<b>Total Off-Site</b>			271863		<b>5274.238</b>	<b>1671.326</b>	<b>1847.182</b>	<b>52.443</b>	<b>125.863</b>

#### **SOURCE:**

CARB MVEI7G Program, 2001 South Coast Air Basin (summer), non-enhanced I/M, 35 mph

#### **ASSUMPTIONS:**

- 1 The hydrocarbon emission factors presented are Reactive Organic Gas (ROG) Efs. The ROG number is a combination of the ROG exhaust + running evaporative losses.
- 2 The PM10 emission factors are Total PM10 Efs. The PM10 Efs include the exhaust PM + Tire Wear PM + Brake Wear PM.
- 3 Emission factors from EMFAC7G (updated February 2000) were used.
- 4 All summertime emission factors were calculated at 75 F.
- 5 Emission factors assume 100% weighting to summertime fuel mix.
- 6 Emission factors include Running Exhaust, Running Evaporative Losses, and PM10 from tire wear and brake wear.
- 7 Sulfur oxide as SO2 emissions were calculated by converting the total daily SO2 mass into grams and then dividing by the total daily vehicle miles traveled. The total daily SO2 and total daily vehicle miles traveled were obtained from the BURDEN output for each modeled year.







**Alternative 3****Number of Vehicle Trips**

	OHV Use	Other Use	Total
Annual Vehicle Trips	765,261	85,029	850,290
Peak Day Vehicle Trips			
Halloween	16,072	1,786	17,858
Thanksgiving	27,546	3,061	30,607
New Year	18,372	2,041	20,413
Martin Luther King's Birthday	11,474	1,275	12,749
President's Day	22,959	2,551	25,510
Easter	18,372	2,041	20,413

**Summary of Estimated Annual Emissions**

Annual Vehicle Trips	CO tons/year	ROG tons/year	NOx tons/year	SOx tons/year	PM10 tons/year
On Road	123.72	39.20	43.33	1.23	43.77
Off Highway	898.37	354.29	53.14	7.59	2123.09
Total	1022.09	393.49	96.47	8.82	2166.86
Future Baseline	1236.39	476	116.7	10.67	2621.19
Net Emissions	-214.30	-82.51	-20.23	-1.85	-454.33
De Minimis Threshold	100.00	50.00	100.00	100.00	100.00

**Summary of Estimated Peak Daily Emissions**

(2012-2013) Peak Day Vehicle Trips	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
On Road	4,677.10	1,482.10	1,638.05	46.51	1,654.54
Off Highway	9,433.91	3,720.42	558.06	79.72	9,216.11
Halloween	14,111.01	5,202.52	2,196.11	126.23	10,870.65
On Road	8,016.12	2,540.19	2,807.46	79.71	2,835.74
Off Highway	16,168.88	6,376.46	956.47	136.64	15,795.58
Thanksgiving	24,185.00	8,916.64	3,763.93	216.34	18,631.32
On Road	5,346.26	1,694.15	1,872.41	53.16	1,891.26
Off Highway	10,783.65	4,252.71	637.91	91.13	10,534.69
New Year	16,129.92	5,946.86	2,510.31	144.29	12,425.95
On Road	3,339.02	1,058.09	1,169.42	33.20	1,181.19
Off Highway	6,734.96	2,656.04	398.41	56.92	6,579.47
Martin Luther King's Birthday	10,073.99	3,714.13	1,567.82	90.12	7,760.67
On Road	6,681.19	2,117.17	2,339.94	66.43	2,363.50
Off Highway	13,476.26	5,314.58	797.19	113.88	13,165.13
President's Day	20,157.46	7,431.75	3,137.12	180.32	15,528.64
On Road	5,346.26	1,694.15	1,872.41	53.16	1,891.26
Off Highway	10,783.65	4,252.71	637.91	91.13	10,534.69
Easter	16,129.92	5,946.86	2,510.31	144.29	12,425.95



<b>Peak Day Baseline (2012-2013)</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Halloween	17072.6	6294.41	2657.02	152.72	13152.17
Thanksgiving	29262.69	10788.71	4554.18	261.77	22543
New Year	19507.93	7192.28	3036.04	174.51	15028.26
Martin Luther King's Birthday	12190.09	4494.3	1897.15	109.05	9390.84
President's Day	24380.17	8988.6	3794.31	218.09	18781.68
Easter	19507.93	7192.28	3036.04	174.51	15028.26

<b>Net Emissions</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Halloween	-2961.59	-1091.89	-460.91	-26.49	-2281.52
Thanksgiving	-5077.69	-1872.07	-790.25	-45.43	-3911.68
New Year	-3378.01	-1245.42	-525.73	-30.22	-2602.31
Martin Luther King's Birthday	-2116.10	-780.17	-329.33	-18.93	-1630.17
President's Day	-4222.71	-1556.85	-657.19	-37.77	-3253.04
Easter	-3378.01	-1245.42	-525.73	-30.22	-2602.31
Significance Threshold	550	137	137	137	137



# FUGITIVE PM10 EMISSION FACTORS

## (I) POTENTIAL SOURCES:

- (1) OHV travel on Unpaved Surfaces.
- (2) Motor Vehicle Travel on Paved Roads.

## (II) EMISSION FACTORS AND ASSUMPTIONS:

- (1) OHV Travel on Unpaved Roads.

Emission Factor (SCAQMD Table A9-9-D): (reference 1)

$$EF(1) = 2.1 (G/12) (H/30) [(J/3)^{0.7}] [(I/4)^{0.5}] [(365-K)/365] \text{ lb/vehicle mile traveled (vmt)}$$

where:

G = Silt Loading (%):	6 (reference 1)
H = Mean Vehicle Speed (mph):	15 (reference 1)
J = Mean Vehicle Weight (tons) - see tables below	(reference 1)
I = Number of Wheels - see tables below	(reference 1)
K = Number of Days > 0.01 in. Precipitation:	18 (reference 1)

4-Wheel All Terrain Vehicles		
Parameter	Loaded	Unloaded
J	1	0.5
I	4	4
PM10 Emission Rate		
lb/VMT	0.23	0.14

Off-Highway Motorcycles		
Parameter	Loaded	Unloaded
J	0.35	0.25
I	2	2
PM10 Emission Rate		
lb/VMT	0.080	0.060

Average OHV Emission Rate = 0.16

	OHV	Estimated Emission Rate	
Annual OHV	26,784,135	2075.77	tons
Halloween	56,253	8719.17	pounds
Thanksgiving	96,412	14943.87	pounds
New Year	64,301	9966.65	pounds
Martin Luther King	40,159	6224.70	pounds
Presidents Day	80,357	12455.26	pounds
Easter	64,301	9966.65	pounds



- (2) Passenger Vehicle Travel on Paved Highways.  
Emission Factor (SCAQMD Table A9-9-B):

$$EF(2) = V \times G \text{ lb}$$

V = Vehicle Miles Traveled

G = 0.0064 lb/VMT (For Major Streets/Highways with street cleaning)

VMT =	12754350
EF(2) =	81627.84 pounds 40.81 tons
Estimated Emission Rate	
Halloween	1542.9312 pounds
Peak Arrival day (veh/day)	241083
Thanksgiving	2644.4448 pounds
Peak Arrival day (veh/day)	413194.5
New Year	1763.6832 pounds
Peak Arrival day (veh/day)	275575.5
Martin Luther King	1101.5136 pounds
Peak Arrival day (veh/day)	172111.5
Presidents Day	2204.064 pounds
Peak Arrival day (veh/day)	344385
Easter	1763.6832 pounds
Peak Arrival day (veh/day)	275575.5



# TABLE OPERATIONAL EMISSIONS FROM OHV SOURCE

Emission Factors (EF) from Table A9-8-B: lb/hp-hr

Off-Highway Vehicles	HP rating	Loading percent	Max hrs/day	Max-daily HP-Hr	EF unit	EF CO	lb/day CO	EF ROG	lb/day ROG	EF NOx	lb/day NOx	EF SOx	lb/day SOx	EF PM10	lb/day PM10
Motorcycles	25	100%	6	150	g/hp-hr	80	1.0582011	10	0.1323	1.5	0.01984	0.95	0.0126	8.2	0.1085
All Terrain Vehicles	125	100%	6	750	g/hp-hr	97.5	1.2896825	60	0.7937	9	0.11905	0.55	0.0073	1.15	0.0152
<b>TOTAL, lb</b>							<b>2.35</b>		<b>0.93</b>		<b>0.14</b>		<b>0.02</b>		<b>0.12</b>
Annual		765,261					898.37188		354.29		53.1431		7.5919		47.323
Halloween		16,072					9433.9137		3720.4		558.063		79.723		496.94
Thanksgiving		27,546					16168.876		6376.5		956.469		136.64		851.71
New Year		18,372					10783.653		4252.7		637.906		91.129		568.04
MLK		11,474					6734.9628		2656		398.406		56.915		354.77
Presidents		22,959					13476.265		5314.6		797.188		113.88		709.88
Easter		18,372					10783.653		4252.7		637.906		91.129		568.04
<b>AQ Significance Thresholds</b>							<b>550</b>		<b>137</b>		<b>137</b>		<b>137</b>		<b>137</b>

Source: EPA Nonroad Engine and Vehicle Study, 1991



### On-Road Mobile Source Emissions Factors

Vehicle Type	CO	ROG	Running Exhaust			Start-Up	Start-Up	Hot Soak	Diurnal	Start-Up
	g/mile	g/mile	NOx g/mile	SOx g/mile	PM10 g/mile	CO g/trip	ROG g/trip	ROG g/trip	ROG g/trip	NOx g/trip
Light-Duty Trucks - Cat	3.24	0.16	0.72	0.01	0.04	0.04	45.7	4.08	0.62	18.96
Heavy Heavy Duty Diesel Truck	7.2	1.22	9.2	0.32	0.72	0	0	0	0	0

### Estimated Vehicle Emissions Annual Average

Vehicle Type	Average worker/day	VMT/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/year	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day	Tons/year
Light-Duty Trucks - Cat	637717.5	15	9565762.5	1275435	196826.389	69833.603	21988.319	210.885	843.542	
Heavy Heavy Duty Diesel Truck	212572.5	15	3188587.5	425145	50612.500	8576.007	64671.528	2249.444	5061.250	
<b>Total Off-Site</b>			12754350		<b>123.719</b>	<b>39.205</b>	<b>43.330</b>	<b>1.230</b>	<b>2.952</b>	

### Halloween

Vehicle Type	Average worker/day	VMT/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
Light-Duty Trucks - Cat	12,054	15	180812.25	24108.3	3720.417	1319.996	415.624	3.986	15.945
Heavy Heavy Duty Diesel Truck	4,018	15	60270.75	8036.1	956.679	162.104	1222.423	42.519	95.668
<b>Total Off-Site</b>			241083		<b>4677.095</b>	<b>1482.100</b>	<b>1638.046</b>	<b>46.505</b>	<b>111.613</b>

### Thanksgiving

Vehicle Type	Average worker/day	VMT/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
Light-Duty Trucks - Cat	20,660	15	309895.88	41319.45	6376.458	2262.354	712.341	6.832	27.328
Heavy Heavy Duty Diesel Truck	6,887	15	103298.63	13773.15	1639.661	277.831	2095.122	72.874	163.966
<b>Total Off-Site</b>			413194.5		<b>8016.119</b>	<b>2540.186</b>	<b>2807.464</b>	<b>79.706</b>	<b>191.294</b>

### New Year

Vehicle Type	Average worker/day	VMT/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
Light-Duty Trucks - Cat	13,779	15	206681.63	27557.55	4252.708	1508.852	475.088	4.556	18.226
Heavy Heavy Duty Diesel Truck	4,593	15	68893.875	9185.85	1093.554	185.297	1397.318	48.602	109.355
<b>Total Off-Site</b>			275575.5		<b>5346.262</b>	<b>1694.149</b>	<b>1872.407</b>	<b>53.159</b>	<b>127.581</b>



### ***Martin Luther King's Birthday***

<b>Vehicle Type</b>	<b>Average worker/day</b>	<b>VMT/trip mi/trip</b>	<b>Total VMT mi/day</b>	<b>Starts No.Day</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Light-Duty Trucks - Cat	8,606	15	129083.63	17211.15	2656.042	942.358	296.718	2.846	11.383
Heavy Heavy Duty Diesel Truck	2,869	15	43027.875	5737.05	682.982	115.728	872.699	30.355	68.298
<b>Total Off-Site</b>			172111.5		<b>3339.024</b>	<b>1058.086</b>	<b>1169.417</b>	<b>33.201</b>	<b>79.681</b>

### ***President's Day***

<b>Vehicle Type</b>	<b>Average worker/day</b>	<b>VMT/trip mi/trip</b>	<b>Total VMT mi/day</b>	<b>Starts No.Day</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Light-Duty Trucks - Cat	17,219	15	258288.75	34438.5	5314.583	1885.603	593.715	5.694	22.777
Heavy Heavy Duty Diesel Truck	5,740	15	86096.25	11479.5	1366.607	231.564	1746.220	60.738	136.661
<b>Total Off-Site</b>			344385		<b>6681.190</b>	<b>2117.167</b>	<b>2339.935</b>	<b>66.432</b>	<b>159.438</b>

### ***Easter***

<b>Vehicle Type</b>	<b>Average worker/day</b>	<b>VMT/trip mi/trip</b>	<b>Total VMT mi/day</b>	<b>Starts No.Day</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Light-Duty Trucks - Cat	13,779	15	206681.63	27557.55	4252.708	1508.852	475.088	4.556	18.226
Heavy Heavy Duty Diesel Truck	4,593	15	68893.875	9185.85	1093.554	185.297	1397.318	48.602	109.355
<b>Total Off-Site</b>			275575.5		<b>5346.262</b>	<b>1694.149</b>	<b>1872.407</b>	<b>53.159</b>	<b>127.581</b>

#### **SOURCE:**

CARB MVEI7G Program, 2001 South Coast Air Basin (summer), non-enhanced I/M, 35 mph

#### **ASSUMPTIONS:**

- 1 The hydrocarbon emission factors presented are Reactive Organic Gas (ROG) Efs. The ROG number is a combination of the ROG exhaust + running evaporative losses.
- 2 The PM10 emission factors are Total PM10 Efs. The PM10 Efs include the exhaust PM + Tire Wear PM + Brake Wear PM.
- 3 Emission factors from EMFAC7G (updated February 2000) were used.
- 4 All summertime emission factors were calculated at 75 F.
- 5 Emission factors assume 100% weighting to summertime fuel mix.
- 6 Emission factors include Running Exhaust, Running Evaporative Losses, and PM10 from tire wear and brake wear.
- 7 Sulfur oxide as SO2 emissions were calculated by converting the total daily SO2 mass into grams and then dividing by the total daily vehicle miles traveled. The total daily SO2 and total daily vehicle miles traveled were obtained from the BURDEN output for each modeled year.







**Alternative 4****Number of Vehicle Trips**

	OHV Use	Other Use	Total
Annual Vehicle Trips	925,714	102,857	1,028,571
Peak Day Vehicle Trips			
Halloween	19,445	2,161	21,606
Thanksgiving	33,330	3,703	37,033
New Year	22,219	2,469	24,688
Martin Luther King's Birthday	13,884	1,543	15,427
President's Day	27,769	3,085	30,854
Easter	22,219	2,469	24,688

**Summary of Estimated Annual Emissions**

Annual Vehicle Trips	CO tons/year	ROG tons/year	NOx tons/year	SOx tons/year	PM10 tons/year
Alternative 4					
On Road	149.66	47.42	52.41	1.49	52.94
Off Highway	1086.73	428.57	64.29	9.18	2568.24
Total	1236.39	476.00	116.70	10.67	2621.19
Existing Condition	599.25	230.21	56.38	5.14	1263.64
Net Emissions	637.14	245.79	60.32	5.53	1357.55
De Minimis Threshold	100.00	50.00	100.00	100.00	100.00

**Summary of Estimated Peak Daily Emissions**

(2012-2013) Peak Day Vehicle Trips	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
On Road	5658.71	1793.16	1981.84	56.27	2001.80
Off Highway	11413.89	4501.25	675.19	96.46	11150.37
Halloween	17072.60	6294.41	2657.02	152.72	13152.17
On Road	9699.12	3073.50	3396.90	96.44	3431.11
Off Highway	19563.57	7715.21	1157.28	165.33	19111.90
Thanksgiving	29262.69	10788.71	4554.18	261.77	22543.00
On Road	6465.91	2048.95	2264.54	64.29	2287.34
Off Highway	13042.03	5143.33	771.50	110.21	12740.92
New Year	19507.93	7192.28	3036.04	174.51	15028.26
On Road	4040.41	1280.34	1415.06	40.17	1429.31
Off Highway	8149.68	3213.96	482.09	68.87	7961.53
Martin Luther King's Birthday	12190.09	4494.30	1897.15	109.05	9390.84
On Road	8080.81	2560.69	2830.12	80.35	2858.62
Off Highway	16299.36	6427.92	964.19	137.74	15923.05
President's Day	24380.17	8988.60	3794.31	218.09	18781.68
On Road	6465.91	2048.95	2264.54	64.29	2287.34
Off Highway	13042.03	5143.33	771.50	110.21	12740.92
Easter	19507.93	7192.28	3036.04	174.51	15028.26



Peak Day Baseline (2012-2013)	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
Halloween	17072.6	6294.41	2657.02	152.72	13152.17
Thanksgiving	29262.69	10788.71	4554.18	261.77	22543
New Year	19507.93	7192.28	3036.04	174.51	15028.26
Martin Luther King's Birthday	12190.09	4494.3	1897.15	109.05	9390.84
President's Day	24380.17	8988.6	3794.31	218.09	18781.68
Easter	19507.93	7192.28	3036.04	174.51	15028.26

Net Emissions	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
Halloween	0.00	0.00	0.00	0.00	0.00
Thanksgiving	0.00	0.00	0.00	0.00	0.00
New Year	0.00	0.00	0.00	0.00	0.00
Martin Luther King's Birthday	0.00	0.00	0.00	0.00	0.00
President's Day	0.00	0.00	0.00	0.00	0.00
Easter	0.00	0.00	0.00	0.00	0.00
Significance Threshold	550	137	137	137	137



# FUGITIVE PM10 EMISSION FACTORS

## (I) POTENTIAL SOURCES:

- (1) OHV travel on Unpaved Surfaces.
- (2) Motor Vehicle Travel on Paved Roads.

## (II) EMISSION FACTORS AND ASSUMPTIONS:

- (1) OHV Travel on Unpaved Roads.

Emission Factor (SCAQMD Table A9-9-D): (reference 1)

$$EF(1) = 2.1 (G/12) (H/30) [(J/3)^{0.7}] [(I/4)^{0.5}] [(365-K)/365] \text{ lb/vehicle mile traveled (vmt)}$$

where:

G = Silt Loading (%):	6 (reference 1)
H = Mean Vehicle Speed (mph):	15 (reference 1)
J = Mean Vehicle Weight (tons) - see tables below	(reference 1)
I = Number of Wheels - see tables below	(reference 1)
K = Number of Days > 0.01 in. Precipitation:	18 (reference 1)

4-Wheel All Terrain Vehicles		
Parameter	Loaded	Unloaded
J	1	0.5
I	4	4
PM10 Emission Rate		
lb/VMT	0.23	0.14

Off-Highway Motorcycles		
Parameter	Loaded	Unloaded
J	0.35	0.25
I	2	2
PM10 Emission Rate		
lb/VMT	0.080	0.060

$$\text{Average OHV Emission Rate} = 0.16$$

	OHV	Estimated Emission Rate	
Annual OHV	32,399,990	2511.00	tons
Halloween	68,059	10549.13	pounds
Thanksgiving	116,654	18081.36	pounds
New Year	77,767	12053.92	pounds
Martin Luther King	48,595	7532.23	pounds
Presidents Day	97,190	15064.47	pounds
Easter	77,767	12053.92	pounds



- (2) Passenger Vehicle Travel on Paved Highways.  
Emission Factor (SCAQMD Table A9-9-B):

$$EF(2) = V \times G \text{ lb}$$

V = Vehicle Miles Traveled

G = 0.0064 lb/VMT (For Major Streets/Highways with street cleaning)

VMT =	15428565
EF(2) =	98742.816
	49.37 tons
Estimated Emission Rate	
Halloween	1866.758602 pounds
Peak Arrival day (veh/day)	291681.0315
Thanksgiving	3199.651546 pounds
Peak Arrival day (veh/day)	499945.554
New Year	2133.04343 pounds
Peak Arrival day (veh/day)	333288.036
Martin Luther King	1332.892944 pounds
Peak Arrival day (veh/day)	208264.5225
Presidents Day	2665.785888 pounds
Peak Arrival day (veh/day)	416529.045
Easter	2133.04343 pounds
Peak Arrival day (veh/day)	333288.036



# TABLE OPERATIONAL EMISSIONS FROM OHV SOURCE

Emission Factors (EF) from Table A9-8-B: lb/hp-hr

Off-Highway Vehicles	HP rating	Loading percent	Max hrs/day	Max-daily HP-Hr	EF unit	EF CO	lb/day CO	EF ROG	lb/day ROG	EF NOx	lb/day NOx	EF SOx	lb/day SOx	EF PM10	lb/day PM10
Motorcycles	25	100%	6	150	g/hp-hr	80	1.0582011	10	0.1323	1.5	0.01984	0.95	0.0126	8.2	0.1085
All Terrain Vehicles	125	100%	6	750	g/hp-hr	97.5	1.2896825	60	0.7937	9	0.11905	0.55	0.0073	1.15	0.0152
<b>TOTAL, lb</b>							<b>2.35</b>		<b>0.93</b>		<b>0.14</b>		<b>0.02</b>		<b>0.12</b>
Annual		925,714					1086.7344		428.57		64.2857		9.1837		57.245
Halloween		19,445					11413.885		4501.3		675.188		96.455		601.24
Thanksgiving		33,330					19563.566		7715.2		1157.28		165.33		1030.5
New Year		22,219					13042.025		5143.3		771.5		110.21		687
MLK		13,884					8149.6809		3214		482.094		68.871		429.29
Presidents		27,769					16299.362		6427.9		964.188		137.74		858.59
Easter		22,219					13042.025		5143.3		771.5		110.21		687
<b>AQ Significance Thresholds</b>							<b>550</b>		<b>137</b>		<b>137</b>		<b>137</b>		<b>137</b>

Source: EPA Nonroad Engine and Vehicle Study, 1991



### On-Road Mobile Source Emissions Factors

Vehicle Type	CO		Running Exhaust		PM10	Start-Up		Start-Up		Hot Soak		Diurnal		Start-Up	
	g/mile	g/mile	NOx	SOx		g/trip	g/trip	g/trip	g/trip	g/trip	g/trip	g/trip	g/trip	g/trip	g/trip
Light-Duty Trucks - Cat	3.24	0.16	0.72	0.01	0.04	45.7	4.08	0.62	18.96	2.42					
Heavy Heavy Duty Diesel Truck	7.2	1.22	9.2	0.32	0.72	0	0	0	0	0					

### Estimated Vehicle Emissions Annual Average

Vehicle Type	Average worker/day	VTM/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/year	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day	
Light-Duty Trucks - Cat	771428.25	15	11571424	1542856.5	238095.139	84475.672	26598.628	255.102	1020.408	
Heavy Heavy Duty Diesel Truck	257142.75	15	3857141.3	514285.5	61224.464	10374.145	78231.260	2721.087	6122.446	
<b>Total Off-Site</b>			15428565		<b>149.660</b>	<b>47.425</b>	<b>52.415</b>	<b>1.488</b>	<b>3.571</b>	<b>Tons/year</b>

### Halloween

Vehicle Type	Average worker/day	VTM/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
Light-Duty Trucks - Cat	14,584	15	218760.77	29168.103	4501.250	1597.035	502.854	4.823	19.291
Heavy Heavy Duty Diesel Truck	4,861	15	72920.258	9722.7011	1157.464	196.126	1478.982	51.443	115.746
<b>Total Off-Site</b>			291681.03		<b>5658.715</b>	<b>1793.160</b>	<b>1981.836</b>	<b>56.266</b>	<b>135.038</b>

### Thanksgiving

Vehicle Type	Average worker/day	VTM/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
Light-Duty Trucks - Cat	24,997	15	374959.17	49994.555	7715.209	2737.341	861.899	8.266	33.065
Heavy Heavy Duty Diesel Truck	8,332	15	124986.39	16664.852	1983.911	336.163	2534.997	88.174	198.391
<b>Total Off-Site</b>			499945.55		<b>9699.120</b>	<b>3073.503</b>	<b>3396.896</b>	<b>96.440</b>	<b>231.456</b>

### New Year

Vehicle Type	Average worker/day	VTM/trip mi/trip	Total VMT mi/day	Starts No.Day	CO lb/day	ROG lb/day	NOx lb/day	SOx lb/day	PM10 lb/day
Light-Duty Trucks - Cat	16,664	15	249966.03	33328.804	5143.334	1824.844	574.584	5.511	22.043
Heavy Heavy Duty Diesel Truck	5,555	15	83322.009	11109.601	1322.572	224.102	1689.953	58.781	132.257
<b>Total Off-Site</b>			333288.04		<b>6465.905</b>	<b>2048.947</b>	<b>2264.536</b>	<b>64.292</b>	<b>154.300</b>



### ***Martin Luther King's Birthday***

<b>Vehicle Type</b>	<b>Average worker/day</b>	<b>VMT/trip mi/trip</b>	<b>Total VMT mi/day</b>	<b>Starts No.Day</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Light-Duty Trucks - Cat	10,413	15	156198.39	20826.452	3213.959	1140.306	359.045	3.444	13.774
Heavy Heavy Duty Diesel Truck	3,471	15	52066.131	6942.1507	826.447	140.037	1056.015	36.731	82.645
<b>Total Off-Site</b>			208264.52		<b>4040.405</b>	<b>1280.343</b>	<b>1415.060</b>	<b>40.174</b>	<b>96.419</b>

### ***President's Day***

<b>Vehicle Type</b>	<b>Average worker/day</b>	<b>VMT/trip mi/trip</b>	<b>Total VMT mi/day</b>	<b>Starts No.Day</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Light-Duty Trucks - Cat	20,826	15	312396.78	41652.904	6427.917	2280.612	718.090	6.887	27.548
Heavy Heavy Duty Diesel Truck	6,942	15	104132.26	13884.301	1652.893	280.074	2112.030	73.462	165.289
<b>Total Off-Site</b>			416529.04		<b>8080.810</b>	<b>2560.686</b>	<b>2830.120</b>	<b>80.349</b>	<b>192.838</b>

### ***Easter***

<b>Vehicle Type</b>	<b>Average worker/day</b>	<b>VMT/trip mi/trip</b>	<b>Total VMT mi/day</b>	<b>Starts No.Day</b>	<b>CO lb/day</b>	<b>ROG lb/day</b>	<b>NOx lb/day</b>	<b>SOx lb/day</b>	<b>PM10 lb/day</b>
Light-Duty Trucks - Cat	16,664	15	249966.03	33328.804	5143.334	1824.844	574.584	5.511	22.043
Heavy Heavy Duty Diesel Truck	5,555	15	83322.009	11109.601	1322.572	224.102	1689.953	58.781	132.257
<b>Total Off-Site</b>			333288.04		<b>6465.905</b>	<b>2048.947</b>	<b>2264.536</b>	<b>64.292</b>	<b>154.300</b>

#### **SOURCE:**

CARB MVEI7G Program, 2001 South Coast Air Basin (summer), non-enhanced I/M, 35 mph

#### **ASSUMPTIONS:**

- 1 The hydrocarbon emission factors presented are Reactive Organic Gas (ROG) Efs. The ROG number is a combination of the ROG exhaust + running evaporative losses.
- 2 The PM10 emission factors are Total PM10 Efs. The PM10 Efs include the exhaust PM + Tire Wear PM + Brake Wear PM.
- 3 Emission factors from EMFAC7G (updated February 2000) were used.
- 4 All summertime emission factors were calculated at 75 F.
- 5 Emission factors assume 100% weighting to summertime fuel mix.
- 6 Emission factors include Running Exhaust, Running Evaporative Losses, and PM10 from tire wear and brake wear.
- 7 Sulfur oxide as SO2 emissions were calculated by converting the total daily SO2 mass into grams and then dividing by the total daily vehicle miles traveled. The total daily SO2 and total daily vehicle miles traveled were obtained from the BURDEN output for each modeled year.











